

A Complete Guide to ...

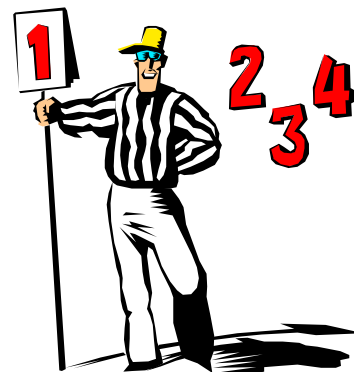
Number

Utilising the objectives as written in
MATHEMATICS in the New Zealand CURRICULUM
for

Level 4

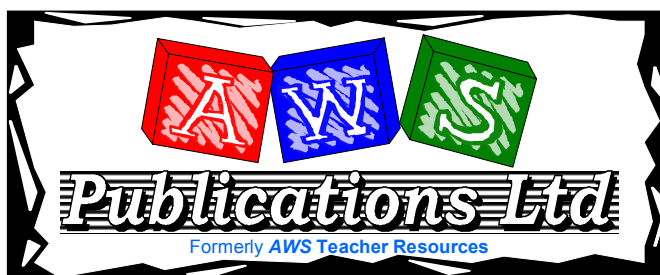
This resource contains:

- ☑ Table of contents
- ☑ Teaching notes
- ☑ In class activity sheets involving
 - worked examples
 - basic skills
 - word problems
 - problem solving
 - group work
- ☑ Homework / Assessment activity sheets
- ☑ Answers



These resources are supplied as **PHOTOCOPY MASTERS**

Author: A. W. Stark



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L4MN

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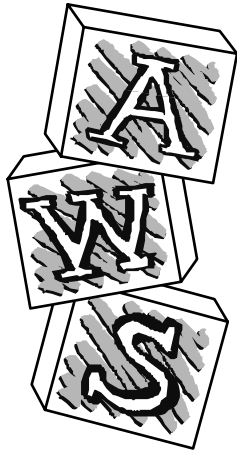
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Note from the author:

This resource ...

*A Complete Guide to Number

is one of a series of **FIVE** resources written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4.

With my experiences as a specialist mathematics teacher, I enjoyed mathematics as a subject, but I am aware that not all teachers feel the same way about mathematics. It can be a difficult subject to teach, especially if you are unsure of the content or curriculum and if resources are limited.

This series of resources has been written with you in mind. I am sure you will find this resource easy to use and of benefit to you and your class.

Resources in this series:

*A Complete Guide to Number

written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4

Resource Code:
L4MN

A Complete Guide to Measurement

written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4.

Resource Code:
L4MM

A Complete Guide to Geometry

written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4.

Resource Code:
L4MG

A Complete Guide to Algebra

written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4.

Resource Code:
L4MA

A Complete Guide to Statistics

written utilising the objectives as stated in

Mathematics in the New Zealand Curriculum for Level 4.

Resource Code:
L4MSt

For more information about these and other resources, please contact ...



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Acknowledgement:

I would like to thank the staff and pupils of **Mairehau Primary School, Christchurch** for their assistance in making these resources possible.

This resource has been divided into EIGHT sections as listed below.

Although there are no page numbers, the sections follow in sequential order as listed.

Note: 'In-class' Worksheets Masters are lesson by lesson reuseable worksheets that can be photocopied or copied on to an OHP.

Homework / Assessment Worksheets Masters can be used as homework to reinforce work covered in class or they can be used for pupil assessment.

| Section | |
|----------|--|
| 1 | List of Number Objectives: Table of 'In-class' Worksheets / Objectives covered |
| 2 | Table of Contents: 'In-class' Worksheets |
| 3 | 'In-class' Worksheets Masters |
| 4 | Teaching Notes / Answers for 'In-class' Worksheets |
| 5 | Table of Contents: Homework / Assessment Worksheets |
| 6 | Homework / Assessment Worksheets Masters |
| 7 | Answers for Homework / Assessment Worksheets |
| 8 | Worksheet tracking sheets for teachers to record pupil names / worksheets covered |

1

Number

The following are the objectives for **Number, Level 4**, as written in the **MATHEMATICS** in the *New Zealand Curriculum* document, first published 1992. **[REFER PAGE 44]**

Exploring number

Within a range of meaningful contexts, students should be able to:

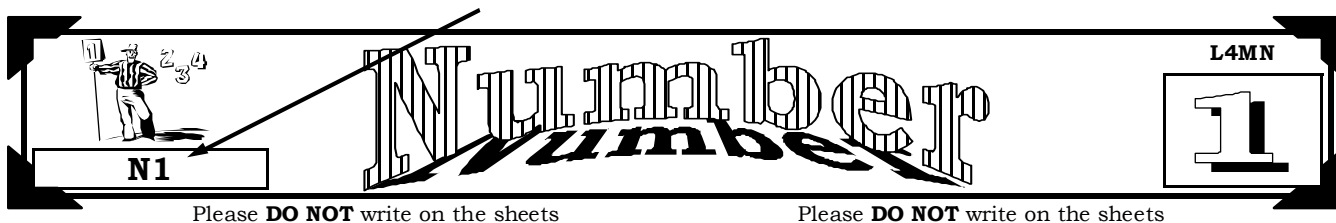
- **N1** explain the meaning of negative numbers;
- **N2** explain the meaning and evaluate powers of whole numbers;
- **N3** find a fraction equivalent to one given;
- **N4** express a fraction as a decimal, and vice versa;
- **N5** express a decimal as a percentage, and vice versa;
- **N6** express quantities as fractions or percentages of a whole.

Exploring computation and estimation

Within a range of meaningful contexts, students should be able to:

- **N7** make sensible estimates and check the reasonableness of answers;
- **N8** write and solve problems involving decimal multiplication and division;
- **N9** find a given fraction or percentage of a quantity;
- **N10** explain satisfactory algorithms for addition, subtraction, and multiplication;
- **N11** demonstrate knowledge of the conventions for order of operations.

At the top of each '**In-class**' **worksheet** and **Homework / Assessment worksheet**, the Number objective(s) being covered has been indicated. *EXAMPLE: N1* means objective 1, *N2* means objective 2, etc.



The Mathematical Processes Skills:

**Problem Solving,
Developing Logic & Reasoning,
Communicating Mathematical Ideas,**

are learned and assessed within the context of the more specific knowledge and skills of number, measurement, geometry, algebra and statistics. The following are the **Mathematical Processes Objectives** for **Level 4**.

Problem Solving Achievement Objectives **[Refer page 24]**

- **MP1** pose questions for mathematical exploration;
- **MP2** effectively plan mathematical exploration;
- **MP3** devise and use problem-solving strategies to explore situations mathematically;
- **MP4** find, and use with justification, a mathematical model as a problem-solving strategy;
- **MP6** use equipment appropriately when exploring mathematical ideas.

Developing Logic and Reasoning Achievement Objectives **[Refer page 26]**

- **MP8** classify objects, numbers and ideas;
- **MP9** interpret information and results in context;
- **MP10** make conjectures in a mathematical context;
- **MP15** use words and symbols to describe and generalise patterns.

Communicating Mathematical Ideas Achievement Objectives **[Refer page 28]**

- **MP16** use their own language and mathematical language and diagrams to explain mathematical ideas;
- **MP17** devise and follow a set of instructions to carry out a mathematical activity;
- **MP20** record information in ways that are helpful for drawing conclusions and making generalisations;
- **MP21** report the results of mathematical explorations concisely and coherently.

Note:

The codes **MP1**, **MP2**, etc. have been created by numbering the **Mathematical Processes Achievement Objectives** in order as listed in the **MATHEMATICS** in the *New Zealand Curriculum* document. The numbering gaps occur as not all objectives are covered at **Level 4**. **[REFER TO PAGES 23 - 29 OF THE CURRICULUM DOCUMENT]**

‘In-class’ Number Worksheets

Table of Worksheet Number / Objectives Covered

See the opposite page for details of each objective.

| Worksheet Number | Number Objectives | | | | | | | | | | | Mathematical Processes Objectives | | | | | | | | | | | | |
|------------------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-----------------------------------|---|---|---|---|---|---|----|----|----|----|----|----|
| | N 1 | N 2 | N 3 | N 4 | N 5 | N 6 | N 7 | N 8 | N 9 | N 10 | N 11 | 1 | 2 | 3 | 4 | 6 | 8 | 9 | 10 | 15 | 16 | 17 | 20 | 21 |
| 1 | | | | | | | | | | | | | | | | | | × | | | | | | |
| 2 | | | | | | | | | | | | × | | × | | | | × | | | | | | |
| 3 | × | | | | | | | | | | | × | | × | | | | × | | | | | | |
| 4 | × | | | | | | | | | | | × | | × | × | | | × | | | | × | | |
| 5 | × | | | | | | | | | | | × | | × | × | | | × | | | | | | |
| 6 | | × | | | | | | | | | | | | × | | | | × | | | | | | |
| 7 | | | × | | | | | | | | | | | × | | | | × | | | | | × | |
| 8 | | | | × | | | | | | | | | | × | | | | × | | | | | × | |
| 9 | | | | × | × | | | | | | | | | × | | | | × | | | | | × | |
| 10 | | | | | | × | | | | | | × | | × | | | | × | | | | | × | |
| 11 | | | | | | | × | | | | | × | | × | | | | × | | | | | × | |
| 12 | | | | | | | × | × | | | | | | × | | | | × | | | | | | |
| 13 | | | | | | | | × | | | | × | | × | | | | × | | | | | × | |
| 14 | | | | | | | | × | | | | × | | × | | | | × | | | | | × | |
| 15 | | | | | | | | | × | | | × | | × | | | | × | | | | | × | |
| 16 | | | | | | | | | × | | | × | | × | | | | × | | | | | × | |
| 17 | | | | | | | | | | × | | | | | | | | × | | | | | × | |
| 18 | | | | | | | | | | | × | × | | × | | | | × | | | | | × | |

Table of Contents for the 'In-class' Worksheet Masters for Number, Level 4

| Worksheet Number | Topic | Number Objective(s) |
|---------------------------------|---|------------------------|
| 1 | Adding and subtracting whole numbers / Multiplying and dividing whole numbers | Revision |
| 2 | Special numbers | Revision |
| 3 | Understanding negative numbers | N1 |
| 4 | Understanding and using number lines | N1 |
| 5 | More negative numbers / Bank overdrafts | N1 |
| 6 | Squares & square roots | N2 |
| 7 | Equivalent fractions | N3 |
| 8 | Expressing a fraction as a decimal / Expressing a decimal as a fraction | N4 |
| 9 | Expressing a decimal as a percentage / Expressing a percentage as a decimal / Converting between fractions, decimals and percentages | N4 / N5 |
| 10 | Expressing a quantity as a fraction or percentage of a whole | N6 |
| 11 | Rounding numbers and finding estimates | N7 |
| 12 | Estimating totals involving money | N7 / N8 |
| 13 | Multiplying and dividing by powers of 10 | N8 |
| 14 | Multiplying and dividing decimals | N8 |
| 15 | Finding a fraction of a quantity | N9 |
| 16 | Finding a percentage of a quantity | N9 |
| 17 | Adding, subtracting and multiplying with accuracy | N10 |
| 18 | Order of operations | N11 |
| Teaching Notes / Answers | | |



Adding and subtracting whole numbers:

The ability to add and subtract with speed and accuracy is a useful skill. Setting out is important, especially when a calculator is not being used.

Example: $235 + 956$ could be written as ...

| |
|-------|
| 235 |
| + 956 |
| _____ |

and $1509 - 986$ could be written as ..

| |
|-------|
| 1509 |
| - 986 |
| _____ |

Task 1

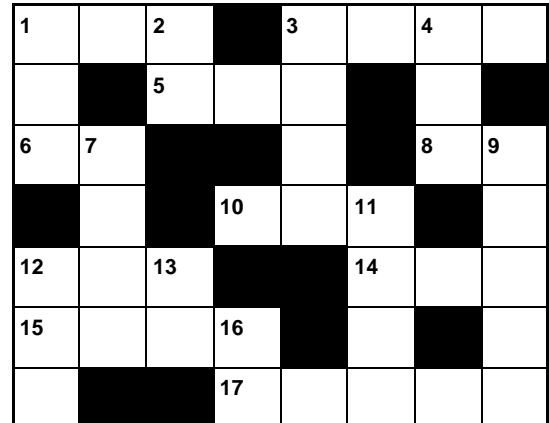
- Copy this 'number cross' into the squares of your maths book.
- Use the clues for **across** and **down** to complete the number cross by working out these addition and subtraction problems.

Clues across

- | | |
|------------------|---------------------|
| 1. $195 + 378$ | 3. $5000 - 703$ |
| 5. $219 + 302$ | 6. $453 - 361$ |
| 8. $624 - 575$ | 10. $679 + 233$ |
| 12. $1000 - 743$ | 14. $269 + 489$ |
| 15. $3604 + 821$ | 17. $29765 + 45475$ |

Clues down

- | | | |
|-------------------|-----------------|--------------------|
| 1. $297 + 232$ | 2. $761 - 726$ | 3. $1963 + 2228$ |
| 4. $2000 - 1096$ | 7. $1378 + 776$ | 9. $54004 + 41866$ |
| 11. $937 + 1815$ | 12. $932 - 683$ | 13. $461 - 389$ |
| 16. $1632 - 1575$ | | |



Multiplying and dividing whole numbers:

The ability to multiply and divide with speed and accuracy is also a useful skill. Setting out is important, to help avoid making mistakes.

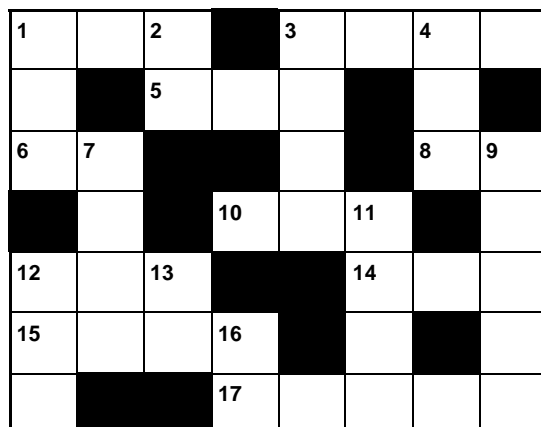
Example: 135×12 could be written as ...

| |
|-------|
| 135 |
| × 12 |
| _____ |

and $4816 \div 4$ could be written as ...

| | |
|---|------|
| 4 | 4816 |
|---|------|

Task 2



- Copy this 'number cross' into the squares of your maths book.
- Use the clues for **across** and **down** to complete the number cross by working out these multiplication and division problems.

Clues across

- | | |
|--------------------|---------------------|
| 1. 25×7 | 3. 820×3 |
| 5. $960 \div 4$ | 6. $343 \div 7$ |
| 8. 31×3 | 10. $1104 \div 3$ |
| 12. $762 \div 6$ | 14. 64×9 |
| 15. 403×6 | 17. 2404×5 |

Clues down

- | | | |
|---------------------|--------------------|--------------------|
| 1. $868 \div 7$ | 2. $468 \div 9$ | 3. 504×4 |
| 4. $2476 \div 4$ | 7. 1604×6 | 9. 6338×5 |
| 11. 1718×5 | 12. $1016 \div 8$ | 13. $852 \div 12$ |
| 16. $891 \div 11$ | | |



**Special numbers:**

"Is the number 6 a prime number?" asked Linda.

"Can you list the first five multiples of 7?" asked Michelle.

"Can you list the factors of 12?" asked Nigel.



Prime numbers, multiples, factors and prime factors are all special types of numbers.

Discuss what makes these numbers special.

Task 3

Copy each sentence below about these special numbers, replacing the ♦ with one of the words listed below.

1. A ♦ number can only be divided by two numbers, itself and 1.
2. The ♦ of a number are found by multiplying the number by 1, 2, 3, 4, 5, etc and recording the answers.
3. A ♦ of a given number is a whole number that divides exactly into the given number. There is no remainder.
4. A ♦ is a factor that is a prime number.

factor
multiples
prime
prime factor

Working with **prime numbers**.

5. List the first 10 prime numbers.
6. List the prime numbers between 40 and 50.
7. Which numbers in this list are prime numbers? 5, 8, 11, 15, 21, 23, 27, 31, 37, 42, 49, 51, 89, 91

The number 9 can be written as two prime numbers. *Example: 7 + 2 = 9.*

Write these numbers as **two prime numbers**.

8. 7
9. 15
10. 28
11. 32
12. 40
13. 48

Working with **multiples**.

List the first 10 multiples of these numbers.

14. 5
15. 9
16. 12
17. 15
18. 19
19. 23
20. List the multiples of 8 that are less than 45.
21. List the multiples of 7 that are between 20 and 60.
22. List the multiples of 13 that are between 35 and 80.

Working with **factors**.

List the factors of these numbers.

23. 6
24. 10
25. 18
26. 24
27. 27
28. 36

The number 15 can be written as two prime factors. *Example: 3 × 5 = 15*

Write these numbers as **two prime factors**.

29. 14
30. 77
31. 35
32. 65
33. 51
34. 85

Task 4

Guess the number game: Read the clues in the box below and then work out the number.

1. I am an odd number.
I am greater than 30,
but less than 45.
I am a multiple of 7.
What number am I?
2. I am an even number.
I am greater than 40,
but less than 56.
I am a multiple of 9.
What number am I?
3. Create 5 similar 'Guess the number' questions, where there is only one correct answer.
Exchange your questions with a classmate.



N1

Number

L4MN

3

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Understanding negative numbers:

Examples: Last night there was a 5 degree frost.

A building has two car park levels beneath the ground floor.

A diver went 30 metres below the surface of the sea.

John's bank account is in overdraft by the sum of \$200.



In these examples, the numbers mentioned could be written as **negative numbers**.

Answers: a -5°C frost, car park levels -1 and -2 , -30m below the surface, and $-\$200$ bank balance.

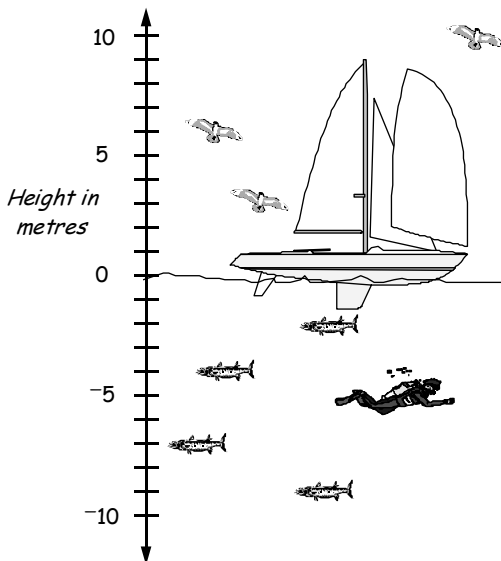
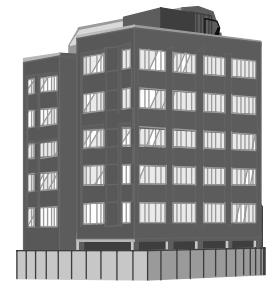
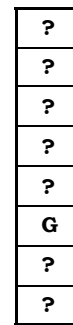
Positive numbers are above zero and the positive sign does not have to be shown.

Negative numbers are below zero, and the small **negative sign** must be shown.

Task 5

A new 6 storey office block has been built, with two additional levels below ground level.

- How would you label the floors of this building. G = ground floor.
- If Miri was on the 2nd floor and goes down 3 floors, which floor would she be at?
- If Rangi was two floors below the ground floor and goes up 5 floors, which floor would he be on?



This diagram shows a sailing ship, a diver, some birds and some fish. The sea level is at zero on the scale drawn.

- How high is the mast above the sea level?
- State** the height of each bird above the sea level as positive numbers.
- State** the depth of the 4 fish below sea level as negative numbers.
- State** the depth of the diver below sea level as a negative number.

A bird is flying 4 metres above the sea, then drops 7 metres straight down.



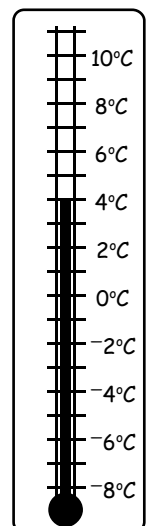
- State** the depth the bird reaches below the surface of the sea, as a negative number.

The temperature scale is one of the most commonly used scales that uses negative numbers, especially when recording maximum and minimum daily temperatures.

- What is the temperature on this diagram of a thermometer?

Use the thermometer scale to **calculate** the new temperatures after the following changes ...

- | | |
|---|---|
| 10. Starting temperature 7°C , drops 5°C | 11. Starting temperature 2°C , rises 5°C |
| 12. Starting temperature 5°C , drops 9°C | 13. Starting temperature 3°C , drops 10°C |
| 14. Starting temperature -2°C , rises 7°C | 15. Starting temperature 0°C , drops 8°C |
| 16. Starting temperature -1°C , drops 6°C | 17. Starting temperature -6°C , rises 9°C |
| 18. Starting temperature 4°C , drops 10°C | 19. Starting temperature -3°C , drops 5°C |
| 20. Starting temperature -8°C , rises 6°C | 21. Starting temperature -6°C , rises 6°C |





N1

Number

L4MN

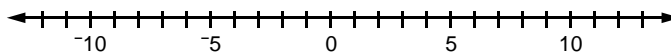
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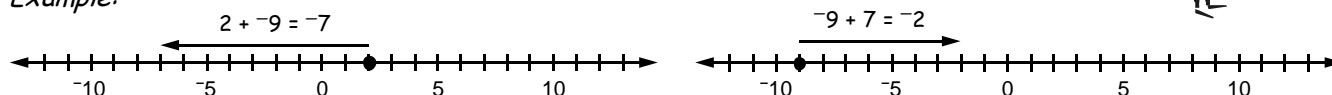
Understanding and using number lines:

Positive and **negative** numbers can be represented on a **number line**. A number line goes on forever, in both directions. *Example:*



A number line can be used to add positive and negative numbers together.

Example:



The first number of the question is the starting point on the number line.

When you add 9 on a number line, which direction do you move?

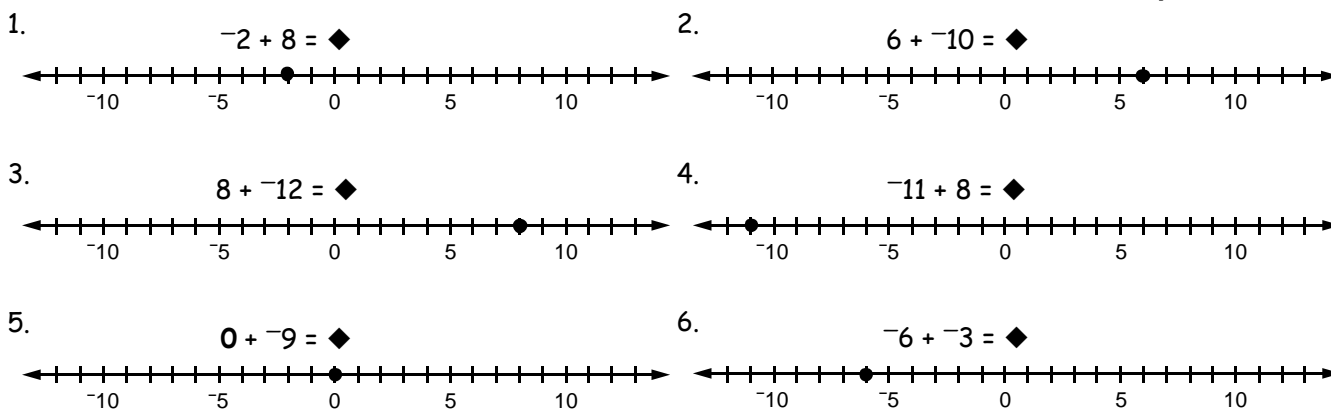
Answer: Move 9 to the right.

When you add -7 on a number line, which direction do you move?

Answer: Move 7 to the left.

Task 6

Use the number lines below to **add** these **positive** and **negative** numbers together. The starting number has been marked with a dot on the number line.



Add these positive and negative numbers, using the number line above, if required.

- | | | | | |
|---------------|----------------|----------------|----------------|----------------|
| 7. $-5 + 9$ | 8. $4 + -7$ | 9. $-8 + 9$ | 10. $7 + -5$ | 11. $-9 + 8$ |
| 12. $7 + -10$ | 13. $-10 + 9$ | 14. $9 + -12$ | 15. $-9 + 15$ | 16. $9 + -13$ |
| 17. $-7 + 16$ | 18. $11 + -17$ | 19. $-12 + 19$ | 20. $10 + -16$ | 21. $-11 + 16$ |
| 22. $9 + -18$ | 23. $7 + -18$ | 24. $6 + -17$ | 25. $11 + -19$ | 26. $-8 + 19$ |
| 27. $-7 + 17$ | 28. $-2 + -6$ | 29. $-3 + -8$ | 30. $-5 + -4$ | 31. $-6 + -5$ |

Task 7

Using a die (dice), play this game in small groups.

The odd numbers are negative, that is, -1 , -3 & -5 . The even numbers are positive, that is, 2 , 4 & 6 .

Roll the die 5 times, recording the numbers that appear, then **add up** the numbers.

Example: $2 + -3 + -1 + 6 + -5 = -1$.

Continue until each pupil has had 5 turns, then total your scores.

The winner is the pupil with the lowest combined score.





N1

Number

L4MN




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More negative numbers:

Sally drew two different coloured circles to represent positive and negative numbers.

 = positive 1 = 1

 = negative 1 = -1

Example: What numbers do these two groups of circles represent?

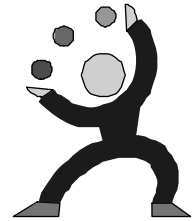


Answer: 5 and -6



(Note: The positive sign is left off the 5)

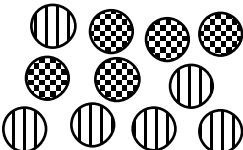
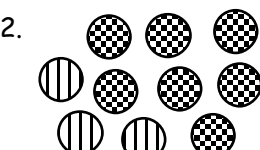
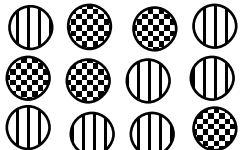
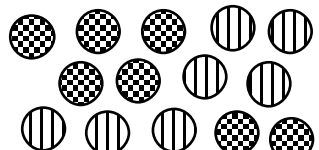
If one positive circle and one negative circle cancel each other, what number do all the circles above represent?

Answer: $5 + -6 = -1$



Task 8

Count the positive  and negative  circles in each group below and write a simple mathematical sentence for each. Remember one positive circle cancels one negative circle. Example: $4 + -9 = -5$.

1.  2.  3.  4. 

Work out these questions involving adding positive and negative numbers.

5. $-6 + 7$ 6. $9 + -12$ 7. $-10 + 9$ 8. $15 + -12$ 9. $-11 + 14$
 10. $20 + -18$ 11. $-18 + 12$ 12. $13 + -12$ 13. $-14 + 18$ 14. $19 + -19$
 15. $-20 + 25$ 16. $18 + -19$ 17. $-23 + 21$ 18. $19 + -20$ 19. $-24 + 27$
 20. $31 + -27$ 21. $27 + -30$ 22. $29 + -32$ 23. $36 + -40$ 24. $50 + 46$
 25. $-50 + 42$ 26. $-15 + -10$ 27. $27 + -36$ 28. $-18 + -23$ 29. $28 + -33$

Bank overdrafts:

When you spend more money than you have in your bank account, your bank account is said to be in **overdraft**. The balance of your account could be written as a negative number.

Banks allow you to go into overdraft, so they can charge you interest on the negative balance.

Example: $-\$200$ means the account is $\$200$ in overdraft.



If Mr Keys has $\$150$ in the bank and withdraws $\$200$, what will his bank balance be? Answer: $-\$50$

Task 9

When money is **deposited** into an account or **withdrawn** from an account, it is called a **transaction**.

Copy this table below, then calculate the **new balance** of this bank account after each transaction.

| 1. | Date | Detail | Withdrawals | Deposits | Balance |
|----|-------|--------------------------|-------------|----------|----------|
| | 14/11 | Opening balance | | | \$250 00 |
| | 15/11 | Bought new bike | \$295. 00 | | |
| | 17/11 | Wages from part-time job | | \$85 60 | |
| | 21/11 | Bought new clothes | \$75 90 | | |
| | 25/11 | Garage sale profits | | \$87 50 | |



2. Create your own bank balance questions and exchange with a classmate.



N2

Number

L4MN

6

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Squares & square roots:

When a number is multiplied by itself, such as ... 1×1 , 2×2 , 3×3 , 4×4 , 5×5 , 6×6 , 7×7 , 8×8 etc. ... the answers that are created, are numbers known as **squares**. That is, 1, 4, 9, 16, 25, 36, 49, 64, ...

These can be written as 1^2 , 2^2 , 3^2 , 4^2 , 5^2 , etc., where the small number 2 is called a **power**.

In this case it is the power of 2. We say 1^2 as *one squared*, 2^2 as *two squared*, 3^2 as *three squared*, etc.

Example: Find the value of nine squared, which is written as 9^2 Answer: $9 \times 9 = 81$

The opposite of squaring a number is to find the **square root**. The symbol for square root is $\sqrt{\quad}$.

Example: If $9^2 = 81$, then $\sqrt{81} = 9$. Find the square root of 144 or $\sqrt{144}$. Answer: 12

What key on a calculator would you use to find the square root of a number? Answer: $\sqrt{\quad}$

Task 10

Calculate the squares of these numbers.

- | | | | | |
|-------------|--------------|--------------|--------------|--------------|
| 1. 6^2 | 2. 9^2 | 3. 12^2 | 4. 10^2 | 5. 5^2 |
| 6. 7^2 | 7. 8^2 | 8. 15^2 | 9. 20^2 | 10. 30^2 |
| 11. 100^2 | 12. 50^2 | 13. 200^2 | 14. 1000^2 | 15. 250^2 |
| 16. 3.4^2 | 17. 7.3^2 | 18. 4.6^2 | 19. 5.9^2 | 20. 2.8^2 |
| 21. 0.9^2 | 22. 0.25^2 | 23. 0.85^2 | 24. 0.12^2 | 25. 1.54^2 |

Calculate the square roots of these numbers.

- | | | | | |
|------------------|------------------|------------------|-------------------|-------------------|
| 26. $\sqrt{64}$ | 27. $\sqrt{16}$ | 28. $\sqrt{81}$ | 29. $\sqrt{121}$ | 30. $\sqrt{49}$ |
| 31. $\sqrt{25}$ | 32. $\sqrt{144}$ | 33. $\sqrt{225}$ | 34. $\sqrt{9}$ | 35. $\sqrt{900}$ |
| 36. $\sqrt{100}$ | 37. $\sqrt{196}$ | 38. $\sqrt{289}$ | 39. $\sqrt{1600}$ | 40. $\sqrt{2500}$ |

Cubes and other powers:

If 2^2 means 2×2 , what does 2^3 mean?

Answer: 2 cubed or $2 \times 2 \times 2 = 8$

Discuss what 2^4 , 2^5 or 2^6 mean.

How do you say 2^4 ?

Answer: "two to the power of 4"



Task 11

Write the following as numbers, without working out the answers ...

- three to the power of five,
- four to the power of three,
- five to the power of six,
- seven to the power of three,
- nine to the power of four,
- ten to the power of six,
- twelve to the power of three,
- twenty to the power of five.



Calculate the following.

- | | | | | |
|-----------|-----------|-----------|------------|-----------|
| 9. 3^3 | 10. 4^3 | 11. 5^3 | 12. 10^3 | 13. 2^4 |
| 14. 2^5 | 15. 2^6 | 16. 3^5 | 17. 7^3 | 18. 9^3 |
| 19. 6^4 | 20. 9^4 | 21. 8^4 | 22. 10^4 | 23. 5^5 |



N3

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7

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Equivalent fractions:

A fraction is part a whole.

Example: A pie is cut into four equal pieces. Each piece of the pie is one quarter of the whole pie. Written as $\frac{1}{4}$, it means 1 out of 4.



If a pie was cut into 8 equal pieces, how many pieces would make up a quarter of the pie?

Answer: 2 out of 8 = $\frac{2}{8}$,

The fractions $\frac{1}{4}$ and $\frac{2}{8}$, are **equivalent fractions**, as they represent the same part or fraction of a whole.

Discuss other fractions that are equivalent to $\frac{1}{4}$.

Task 12

1. What fraction of each group of diagrams (A to H) is shaded?

A B C D E F G H

2. From your answers to question 1 above, match the equivalent fractions.

To **create equivalent fractions**, multiply (or divide) the top and bottom numbers of the fraction by the same number. An equivalent fraction to $\frac{1}{4}$ can be created by multiplying by 5, or any other number.

Example: $\frac{1}{4} \times \frac{5}{5} = \frac{1 \times 5}{4 \times 5} = \frac{5}{20}$. Another equivalent fraction would be ... $\frac{1}{4} \times \frac{9}{9} = \frac{1 \times 9}{4 \times 9} = \frac{9}{36}$

Complete each calculation to **create** equivalent fractions.

3. $\frac{1}{4} \times \frac{5}{5} = \blacklozenge$ 4. $\frac{1}{2} \times \frac{8}{8} = \blacklozenge$ 5. $\frac{1}{5} \times \frac{5}{5} = \blacklozenge$ 6. $\frac{1}{7} \times \frac{4}{4} = \blacklozenge$
 7. $\frac{2}{7} \times \frac{4}{4} = \blacklozenge$ 8. $\frac{2}{3} \times \frac{7}{7} = \blacklozenge$ 9. $\frac{3}{8} \times \frac{7}{7} = \blacklozenge$ 10. $\frac{5}{8} \times \frac{5}{5} = \blacklozenge$
 11. $\frac{3}{8} \times \frac{3}{3} = \blacklozenge$ 12. $\frac{4}{9} \times \frac{5}{5} = \blacklozenge$ 13. $\frac{6}{11} \times \frac{3}{3} = \blacklozenge$ 14. $\frac{3}{7} \times \frac{11}{11} = \blacklozenge$

Copy and **complete** these equivalent fractions as you replace the \blacklozenge with a number.

15. $\frac{1}{4} = \blacklozenge / 8$ 16. $\frac{1}{2} = \blacklozenge / 10$ 17. $\frac{1}{3} = \blacklozenge / 9$ 18. $\frac{1}{5} = \blacklozenge / 20$ 19. $\frac{1}{8} = \blacklozenge / 32$
 20. $\frac{3}{4} = \blacklozenge / 12$ 21. $\frac{2}{3} = \blacklozenge / 12$ 22. $\frac{3}{5} = \blacklozenge / 10$ 23. $\frac{4}{7} = \blacklozenge / 14$ 24. $\frac{5}{6} = \blacklozenge / 30$
 25. $\frac{5}{12} = \blacklozenge / 24$ 26. $\frac{8}{16} = \blacklozenge / 4$ 27. $\frac{15}{30} = \blacklozenge / 6$ 28. $\frac{5}{20} = \blacklozenge / 4$ 29. $\frac{12}{36} = \blacklozenge / 3$

Match the fractions listed below with an **equivalent** fraction in the box, then **create** your own **equivalent** fraction for each.

30. $\frac{1}{4}$ 31. $\frac{1}{2}$ 32. $\frac{2}{3}$
 33. $\frac{3}{5}$ 34. $\frac{5}{6}$ 35. $\frac{3}{4}$
 36. $\frac{3}{8}$ 37. $\frac{4}{7}$ 38. $\frac{5}{9}$

| | | |
|-----------------|-----------------|-----------------|
| $\frac{30}{36}$ | $\frac{8}{32}$ | $\frac{9}{24}$ |
| $\frac{12}{18}$ | $\frac{15}{27}$ | $\frac{12}{20}$ |
| $\frac{16}{28}$ | $\frac{17}{34}$ | $\frac{45}{60}$ |



N4

Number

L4MN

8

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Expressing a fraction as a decimal:

The top number of a fraction is called the **numerator**. The bottom number is called the **denominator**.

Example: In the fraction $\frac{3}{4}$, 3 is the numerator and 4 is the denominator.

Fractions can be converted into decimals by dividing the numerator by the denominator.

Example: Convert $\frac{3}{4}$ to a decimal.

$$\begin{array}{r} 0.75 \\ 4 \overline{)3.00} \end{array}$$

Zeros will need to be added after the decimal point.

You keep dividing until there is no remainder or there are at least 3 digits after the decimal point.



Answer: The fraction $\frac{3}{4}$ converted to a decimal is 0.75.

Some fractions can be simplified by dividing the numerator and denominator by the same number.

Example: $\frac{50}{100}$ (divide by 10) = $\frac{5}{10}$ (divide by 5) = $\frac{1}{2}$ This will make the conversion to a decimal easier.

Some fractions create interesting decimals, with a recurring pattern of digits.

Example: $\frac{2}{9} = 0.2222\dot{2}$ This small dot means that the 2's go on forever.

$\frac{3}{11} = 0.272\dot{7}$ Both the digits 2 and 7 repeat in this decimal.

Task 13

Convert these fractions to decimals. Some fractions can be simplified first. *Example:* $\frac{8}{10} = \frac{4}{5}$

- | | | | | |
|--------------------|---------------------|--------------------|--------------------|--------------------|
| 1. $\frac{1}{4}$ | 2. $\frac{3}{8}$ | 3. $\frac{1}{10}$ | 4. $\frac{2}{5}$ | 5. $\frac{5}{8}$ |
| 6. $\frac{8}{10}$ | 7. $\frac{5}{100}$ | 8. $\frac{4}{5}$ | 9. $\frac{4}{8}$ | 10. $\frac{3}{10}$ |
| 11. $\frac{3}{5}$ | 12. $\frac{6}{8}$ | 13. $\frac{4}{12}$ | 14. $\frac{7}{10}$ | 15. $\frac{1}{2}$ |
| 16. $\frac{5}{20}$ | 17. $\frac{12}{16}$ | 18. $\frac{6}{10}$ | 19. $\frac{8}{12}$ | 20. $\frac{9}{15}$ |

Investigate the patterns created when you convert these fractions ...

21. $\frac{1}{11}, \frac{2}{11}, \frac{3}{11}, \frac{4}{11}, \frac{5}{11}, \frac{6}{11}, \frac{7}{11}, \frac{8}{11}, \frac{9}{11}$ and $\frac{10}{11}$ to decimals.
22. $\frac{1}{9}, \frac{2}{9}, \frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}$ and $\frac{8}{9}$ to decimals.
23. $\frac{1}{7}, \frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}$ and $\frac{6}{7}$ to decimals.

Expressing a decimal as a fraction:

Decimals can be expressed as special fractions, with denominators of 10, 100, 1000 etc.

Example: Convert 0.5, 0.25 and 0.013 to fractions.

Answers: One digit after the decimal point, therefore 10 is the denominator, $\frac{5}{10}$

Two digits after the decimal point, therefore 100 is the denominator, $\frac{25}{100}$

Three digits after the decimal point, therefore 1000 is the denominator, $\frac{13}{1000}$



Task 14

Convert these decimals to fractions.

- | | | | | |
|-----------|------------|-----------|-----------|------------|
| 1. 0.9 | 2. 0.09 | 3. 0.009 | 4. 0.23 | 5. 0.014 |
| 6. 0.12 | 7. 0.3 | 8. 0.302 | 9. 0.42 | 10. 0.3 |
| 11. 0.345 | 12. 0.0234 | 13. 0.95 | 14. 0.8 | 15. 0.69 |
| 16. 0.8 | 17. 0.635 | 18. 0.7 | 19. 0.309 | 20. 0.0005 |
| 21. 0.94 | 22. 0.07 | 23. 0.903 | 24. 0.63 | 25. 0.625 |



N4 / N5

Number

L4MN

9

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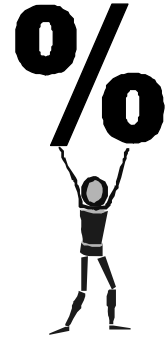
Expressing a decimal as a percentage:

Fractions which are out of 100 are commonly known as **percentages**.

Example: 25 out of 100 could be written as the fraction $\frac{25}{100}$
or as a percentage 25%, which is read as "25 per cent".

To convert a decimal to a percentage, multiply the decimal by 100.

Example: $0.2 \times 100 = 20\%$, $0.06 \times 100 = 6\%$, $1.25 \times 100 = 125\%$



Task 15

Convert these decimals to percentages.

- | | | | | |
|-----------|-----------|-----------|-----------|-----------|
| 1. 0.25 | 2. 0.09 | 3. 0.06 | 4. 0.15 | 5. 0.014 |
| 6. 0.19 | 7. 0.3 | 8. 0.65 | 9. 0.42 | 10. 0.95 |
| 11. 0.345 | 12. 0.45 | 13. 0.095 | 14. 0.8 | 15. 0.6 |
| 16. 0.75 | 17. 0.635 | 18. 0.7 | 19. 0.309 | 20. 0.01 |
| 21. 0.045 | 22. 1.3 | 23. 2.65 | 24. 0.035 | 25. 0.065 |

Expressing a percentage as a decimal:

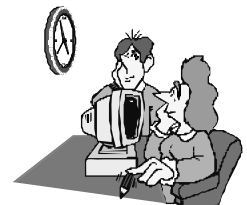
Percentages are out of 100 and can be written as a fraction. To convert a fraction to a decimal we divide the numerator by the denominator. For all percentages written as fractions, the denominator is 100.

Therefore to convert a percentage to a decimal, **divide the percentage by 100**.

Example: Convert 60% to a decimal.

Answer: 60% is the same as $\frac{60}{100}$, therefore $60 \div 100 = 0.6$

To convert a percentage to a decimal, divide the percentage by 100.



Task 16

Convert these percentages to decimals.

- | | | | | |
|----------|----------|----------|-----------|-----------|
| 1. 65% | 2. 50% | 3. 9% | 4. 15% | 5. 45% |
| 6. 87% | 7. 55% | 8. 100% | 9. 17% | 10. 5% |
| 11. 52% | 12. 40% | 13. 93% | 14. 80% | 15. 23% |
| 16. 75% | 17. 66% | 18. 30% | 19. 37.5% | 20. 80.5% |
| 21. 1.8% | 22. 140% | 23. 235% | 24. 137% | 25. 306% |

Converting between fractions, decimals and percentages.

Task 17

Copy this table of commonly used fractions, decimals and percentages.

Complete the table by filling in the gaps using the fractions, decimals and percentages from the box at the right.

| Fraction | Decimal | Percentage |
|---------------|---------|------------|
| $\frac{1}{4}$ | | |
| | 0.3 | |
| | | 40% |
| $\frac{1}{2}$ | | |
| | | 66.6% |
| | 0.75 | |

| | | |
|---------------|---------------|---------------|
| 0.4 | 0.5 | 0.6 |
| 0.25 | $\frac{1}{3}$ | 75% |
| 25% | 50% | $\frac{3}{4}$ |
| $\frac{2}{5}$ | 33.3% | $\frac{2}{3}$ |



N6

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10

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Expressing a quantity as a fraction or percentage of a whole:

Six pupils in a class of 24 like playing hockey.

Four out of 20 pupils were away from school today.

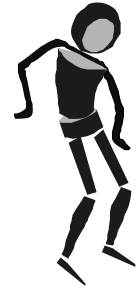
On 10 of the last 20 days it has rained.

In all of these statements there is information that can be expressed or written as a fraction or a percentage.

Example: $\frac{6}{24}$ or $\frac{1}{4}$ or 25% of the pupils like playing hockey,

$\frac{4}{20}$ or $\frac{1}{5}$ or 20% of the pupils were away from school today,

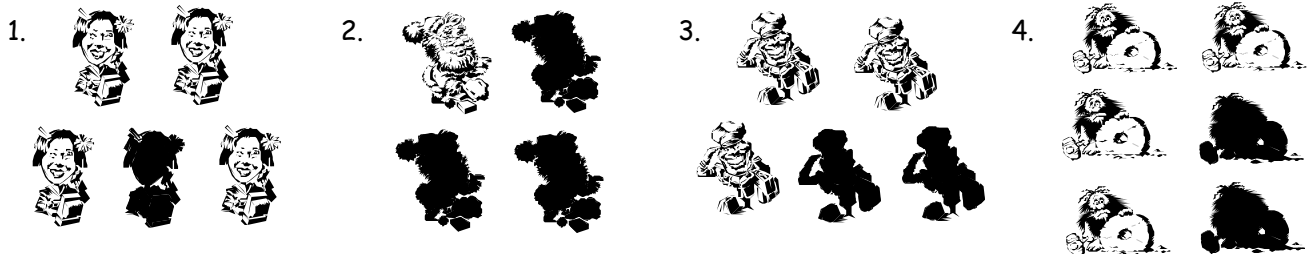
On $\frac{10}{20}$ or $\frac{1}{2}$ or 50% of the last 20 days it has been raining.



Discuss events that you can express as fractions or percentages.

Task 18

Express the shaded diagrams as a **fraction** and as a **percentage** of each group of diagrams.



Read each statement and **write** the information as a **fraction**.

5. Joanne scored 21 out of 25 in a maths test.
6. 31 pupils in a school of 250 are in Room 7.
7. Of 50 pets, 29 were cats.
8. It has rained on 5 days this week.
9. What fraction of your class are girls?
10. What fraction of the week is the weekend?

Read each statement and **write** the information as a **percentage**. Follow the steps in this example below.

Example: Sally scored 15 out of 20 in a test.

Step 1: Write the information as a fraction.

$$\frac{15}{20}$$

Step 2: Write an equivalent fraction, with a denominator of 100.

$$\frac{15}{20} \times \frac{5}{5} = \frac{75}{100}$$

Step 3: Write the fraction as a decimal, then multiply by 100, or 75 out of 100 is 75%.

$$0.75 \times 100 = 75\%$$

11. Joanne scored 80 out of 100 in a maths test.
12. 25 pupils in a school of 100 are in Room 7.
13. Of 50 pets, 24 were cats.
14. It has rained during 15 days out of 20 days.
15. 7 out of 25 pupils were away from school.
16. 2 out of 3 people watch the rugby test.

Mr Moore's car has a 50L petrol tank. He goes on a long trip and then refills the tank.

17. If the refilling of the petrol tank takes 35L, what **fraction** of a full tank was used during the trip? **Convert** your answer to a **percentage**.



A school cross country race is 4 laps around the school grounds.

18. If Karen has completed 3 laps, what **fraction** of the race has she completed so far? **Convert** your answer to a **percentage**.
19. What **percentage** of the race does she have left to run? **Convert** your answer to a **fraction**.



N7

Number

L4MN

11

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Rounding numbers and finding estimates:

When an accurate answer is not required or when doing a quick calculation, rounding a number can be a useful skill to use.

Example: What would 19 items at \$9.95 each cost?

Answer: Round 19 to 20 and round \$9.95 to \$10, estimated price would be $20 \times \$10 = \200 .

The exact cost would be $\$9.95 \times 19 = \189.05 .

How close was the estimate?



Task 19

Round these numbers to the nearest 10.

- | | | | | |
|--------|--------|--------|--------|---------|
| 1. 27 | 2. 52 | 3. 85 | 4. 71 | 5. 129 |
| 6. 143 | 7. 175 | 8. 231 | 9. 266 | 10. 342 |

Round these numbers to the nearest 100.

- | | | | | |
|----------|----------|----------|----------|----------|
| 11. 53 | 12. 143 | 13. 251 | 14. 732 | 15. 942 |
| 16. 1346 | 17. 1637 | 18. 3248 | 19. 4386 | 20. 5084 |

Round these numbers to the nearest 1000.

- | | | | | |
|----------|----------|----------|----------|----------|
| 21. 3658 | 22. 2423 | 23. 6495 | 24. 7510 | 25. 3417 |
| 26. 6709 | 27. 8349 | 28. 7362 | 29. 9852 | 30. 9234 |

Round these numbers to the nearest 10, 100 or 1000. before working out an estimated answer.

- | | | | |
|----------------------|-------------------|--------------------|-------------------|
| 31. $98 + 183$ | 32. $594 - 209$ | 33. 79×34 | 34. $495 \div 9$ |
| 35. 1186×23 | 36. $9568 + 3149$ | 37. $5016 \div 11$ | 38. $6124 - 3867$ |

39. **Calculate** the actual answers for questions 31 to 38 above. How close were your estimates?

A truck driver records the distances he travels each day for a week as shown below.

149km, 205km, 93km, 112km, 166km, 131km, 185km

40. **Work out** the **estimated** total distance he travelled by rounding to the nearest 10km.
41. **Calculate** the exact distance travelled during this week.
42. If it costs 57 cents per kilometre to run the truck, **estimate** the cost of running the truck for this week. **Calculate** the exact running costs.



The length of each telephone call Brian made during the weekend has been recorded below. The time has been recorded in minutes.

19, 27, 12, 23, 41, 26, 8, 17, 29, 42



43. **Work out** the **estimated** total time he spoke on the telephone by rounding to the nearest 10 minutes.
44. **Calculate** the exact time Brian spoke on the telephone.
45. If calls cost 22 cents a minute, **estimate** the cost of Brian's telephone calls. **Calculate** the exact cost of his telephone calls.
46. **Create** your own questions that involve estimating. Exchange your questions with a classmate so that she / he can work out the estimated answers, then the exact answers.



N7 / N8

Number

L4MN

12

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Estimating totals involving money:

As Jenny went around the supermarket, she kept a running total of how much she was spending.

Example: The items she bought cost ... \$1.95, \$0.95, \$4.20, \$5.90, \$1.05 and \$9.95.



What totals do you think Jenny added up as she shopped?

Answer: 2, 1, 4, 6, 1 and 10, giving her a total of 24. Therefore Jenny has spent about \$24 so far.

The ability to estimate quickly and accurately can be a useful skill.

Task 20



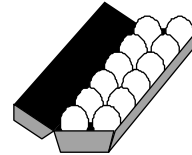
carrots
\$1.90 / kg



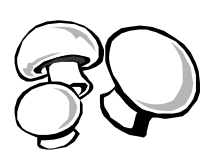
broccoli
\$5.90 / kg



corn cobs
3 for 90 cents



eggs
\$2.45 / doz



mushrooms
\$7.90 / kg



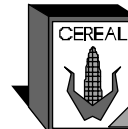
potatoes
\$3.10 / 3kg bag



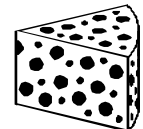
beans
\$2.90 / kg



bananas
\$2.80 / kg



cereal
\$3.65 / box



cheese
\$4.60 / 1kg block

Estimate the cost of buying

1. 4kgs of carrots, 2. 2 dozen eggs, 3. 3 boxes of cereal.

4. Estimate the total cost of each shopping list (A to H) by rounding the cost of each item first.

List A

- 2kgs of carrots
- 9 corn cobs
- 1 dozen eggs
- ½kg of mushrooms
- 1kg block of cheese

List B

- 1kg of broccoli
- 3kgs of potatoes
- 2kgs of beans
- 1½kgs of bananas
- 2 boxes of cereal

List C

- 3kgs of carrots
- 1kg of broccoli
- 12 corn cobs
- 1kg of mushrooms
- 6kgs of potatoes

List D

- 2 dozen eggs
- 1½kgs of mushrooms
- 6kgs of potatoes
- 2kgs of beans
- 2kgs of cheese

List E

- 2kg of broccoli
- 3kgs of cheese
- 2 boxes of cereal
- 1 dozen eggs
- 3kgs of carrots
- 9 corn cobs

List F

- 3kgs of beans
- ½kg of mushrooms
- 9kgs of potatoes
- 2kgs of cheese
- 1½kgs of bananas
- 6 corn cobs

List G

- 4kgs of carrots
- 1½kgs of broccoli
- 12kgs of potatoes
- 1 dozen eggs
- 2kgs of cheese
- 3kgs of beans

List H

- 2kgs of mushrooms
- 1½kgs of beans
- 3kgs of bananas
- 15 corn cobs
- 9kgs of potatoes
- 3kgs of cheese

5. Check how close your estimate totals are by **calculating** the **actual cost** of each shopping list (A to H) above.



6. **Create** your own shopping lists using the items above, or make up your own items and prices. Have a classmate work out the **estimated cost** and **actual cost** of each shopping list.



N8

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L4MN

13

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Multiplying and dividing by powers of 10:

Some of the **powers of 10** and the numbers they represent are listed below.

$$10^1 = 10, 10^2 = 100, 10^3 = 1000, 10^4 = 10000.$$

To multiply and divide by the powers of 10 is not as difficult as it might seem.

Examples: $1.3 \times 10000 = 13000$, $56.2 \times 100 = 5620$, $785.4 \div 100 = 7.854$, $9.7 \div 1000 = 0.0097$

In each example, the digits have remained the same, but the decimal point has moved.



Task 21

Calculate the following.

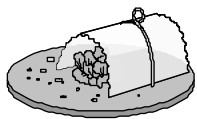
- | | | | |
|-----------------------|------------------------|------------------------|------------------------|
| 1. 5.3×100 | 2. 7.7×1000 | 3. 84×100 | 4. 0.6×1000 |
| 5. 1.9×10000 | 6. 6.37×100 | 7. 94.3×10000 | 8. 8.05×10000 |
| 9. 562×100 | 10. 0.07×1000 | 11. 1.94×1000 | 12. 0.059×100 |
| 13. 2.6×10^4 | 14. 1.5×10^3 | 15. 9.6×10^4 | 16. 5.2×10^5 |
17. Look at the answers for the questions above involving multiplication. Can you **describe** a simple method for working out the answers without having to actually do the calculation?

Calculate the following.

- | | | | |
|---------------------|----------------------|------------------------|------------------------|
| 18. $6.3 \div 10$ | 19. $5.1 \div 1000$ | 20. $97 \div 100$ | 21. $165 \div 1000$ |
| 22. $3.8 \div 1000$ | 23. $4.27 \div 100$ | 24. $123.8 \div 10000$ | 25. $12.05 \div 10000$ |
| 26. $712 \div 100$ | 27. $0.27 \div 1000$ | 28. $1.87 \div 1000$ | 29. $5.3 \div 10$ |
| 30. $9.6 \div 10^3$ | 31. $4.7 \div 10^2$ | 32. $1.5 \div 10^4$ | 33. $3.3 \div 10^2$ |
34. Look at the answers for the questions above involving division. Can you **describe** a simple method for working out the answers without having to actually do the calculation?

Use your methods described above to answer these questions.

- | | | | |
|------------------------|-------------------------|------------------------|-------------------------|
| 35. 3.95×10^3 | 36. $6.25 \div 10^2$ | 37. 9.62×10^5 | 38. $3.091 \div 10^2$ |
| 39. 2.68×10^4 | 40. 9.346×10^6 | 41. $2.75 \div 10^4$ | 42. 9.785×10^5 |

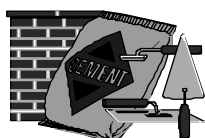


In a market garden, lettuce plants are planted in rows of 100 plants.

43. Calculate the number of lettuce plants in 8 rows.
44. How many rows of lettuce plants are used up if 250 lettuces were picked last week?

A school sells pens and note books to its pupils.

45. Calculate the cost of buying 100 pencils at 25 cents each.
46. If 1000 school note books cost \$600.00, what would it cost to buy one note book?



A brick fence is to be built using 10000 bricks.

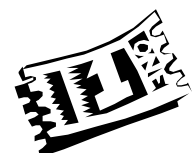
47. Calculate the cost of the bricks, if each brick costs 25 cents.
48. If 1000 bricks \$400.00, calculate the cost of one brick.

In a national raffle, there are 100000 tickets to be sold.

49. If tickets sell for \$1.50, how much money will be made when all tickets are sold?

A second raffle raised \$200000 from the 100000 tickets sold.

50. What was the cost of the tickets in the second raffle?





N8

Number

L4MN

14

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Multiplying and dividing decimals:

When multiplying or dividing using decimals, setting out the question correctly is important, especially when a calculator is not being used.



Example: 2.38×0.9 could be rewritten as ... and $3.65 \div 0.5$ could be rewritten as ...

$$\begin{array}{r} 2.38 \\ \times 0.9 \\ \hline 2.142 \end{array}$$

By counting the digits to the right of the decimal point in the question, the position of the decimal point in the answer can be found.

$$0.5 \overline{)3.65} \longrightarrow \begin{array}{r} 07.3 \\ 5 \overline{)36.5} \end{array}$$

The decimal point is moved to the right, the same number of places in both numbers, so that you are dividing by a whole number.

That is, 0.5 becomes 5, and 3.65 becomes 36.5.

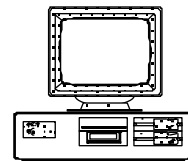
Task 22

Calculate the following, setting out the questions correctly to avoid mistakes.

- | | | | |
|-------------------------|---------------------------|-------------------------|--------------------------|
| 1. 2.976×9 | 2. $48.4 \div 0.2$ | 3. 23.95×1.2 | 4. $68.55 \div 0.5$ |
| 5. $100.96 \div 0.04$ | 6. 6.47×2.1 | 7. $2.785 \div 0.05$ | 8. 96.8×0.12 |
| 9. $81.96 \div 1.2$ | 10. $50.616 \div 0.9$ | 11. 36.85×2.5 | 12. $57.51 \div 0.9$ |
| 13. 1238×0.006 | 14. 0.384×52 | 15. 0.096×24.8 | 16. $4.352 \div 0.4$ |
| 17. $71.753 \div 0.011$ | 18. 16.295×0.025 | 19. $476.64 \div 0.09$ | 20. 0.231×0.012 |

A school is going to buy some new computers that will cost \$2195.90 each.

21. Calculate the cost of buying 4, 7 and 12 computers.



A school is charged 1.5 cents per copy, for photocopying A4 sized paper.

22. Convert 1.5 cents to dollars.
23. Calculate the cost of copying 700, 1000 and 1500 copies. State your answers in dollars.

A travelling salesman recorded the distances he travelled each day for a week, including the weekend.

24. If he travelled 612.92km during this week, calculate the average (mean) distance he travelled each day of the week.
25. If he averaged 84.53km each day for 15 days, calculate the total distance he would travel during this time.
26. If he used 66L of petrol, at a cost of \$0.875 / L, calculate the total cost of petrol he used.



A motor cycle race is being raced around a local street course that is 3.75km per lap.

27. Calculate the total distance of a 20 lap, 50 lap and 100 lap race? Answer in kilometres.

The average time taken per lap is 69.3 seconds.

28. Calculate the time taken to complete a 75 lap race. Answer in seconds.
29. Convert the race time to minutes.

30. Create word problems involving the multiplication and division of decimals. Exchange your questions with a classmate and compare answers.





N9

Number

L4MN

15

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Finding a fraction of a quantity:

Kim has \$60 that is to be shared among 4 people. Each person will receive a quarter of the amount.

Example: Find $\frac{1}{4}$ of \$60.00, then find $\frac{3}{4}$ of \$60.00.

Answers: $\frac{1}{4}$ means 1 out of 4, therefore divide the total by 4. $\$60 \div 4 = \15

$\frac{3}{4}$ means 3 out of 4, therefore, divide the total by 4 and multiply by 3. $\$60 \div 4 = \15 , $\$15 \times 3 = \45

Task 23

Calculate the following fractions of these whole numbers.

- | | | | |
|-------------------------|--------------------------|-------------------------|-------------------------|
| 1. $\frac{1}{4}$ of 40 | 2. $\frac{1}{5}$ of 60 | 3. $\frac{1}{6}$ of 36 | 4. $\frac{1}{9}$ of 45 |
| 5. $\frac{1}{10}$ of 90 | 6. $\frac{2}{5}$ of 40 | 7. $\frac{3}{8}$ of 56 | 8. $\frac{2}{7}$ of 42 |
| 9. $\frac{5}{9}$ of 54 | 10. $\frac{7}{8}$ of 56 | 11. $\frac{6}{7}$ of 63 | 12. $\frac{2}{9}$ of 45 |
| 13. $\frac{5}{6}$ of 60 | 14. $\frac{7}{11}$ of 77 | 15. $\frac{3}{4}$ of 72 | 16. $\frac{5}{8}$ of 96 |
| 17. $\frac{5}{7}$ of 42 | 18. $\frac{8}{11}$ of 88 | 19. $\frac{5}{6}$ of 54 | 20. $\frac{7}{9}$ of 81 |

One third of a class of 24 pupils have been involved in a Mathematics competition.

21. **Calculate** the number of pupils who were involved in this competition.



One quarter of a class of 28 play softball.

22. **Calculate** the number of pupils who play softball.



During the past 30 days, the weather conditions were recorded.

23. On $\frac{1}{5}$ of the days it rained. **Calculate** the number of days it rained.

24. On $\frac{3}{5}$ of the days it was sunny. **Calculate** the number of days it was sunny.

During the holidays, Karen has been camping with her friends.

25. On the first day they spent $\frac{3}{8}$ of the day tramping to the camp site.

Calculate the number of hours they spent tramping.

26. On the second day, they spent $\frac{5}{12}$ of the day resting.

Calculate the number of hours they spent resting.



A school cross country race is run over a distance of 5400m.

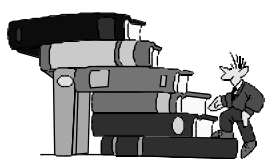
27. If Rangī has completed $\frac{7}{10}$ of the course, **calculate** how far he has run so far.

28. How far does Rangī have left to run? Give your answer as a fraction of the total distance and state the distance he has left to run.

A 36m long fence around a swimming pool is to be painted.

29. If $\frac{5}{12}$ of the fence has already been painted, **calculate** the length of the fence that has been painted.

30. What **fraction** of the fence has yet to be painted?



In the school library there are 480 books.

31. If $\frac{1}{3}$ of the books are suitable for pupils 9 years old or younger, how many books is that?

32. If $\frac{5}{12}$ of the books are fiction, how many books is that?

33. If $\frac{3}{8}$ of the books are non-fiction, how many books is that?

34. **Create** word problems involving **finding fractions** of a quantity.

Exchange your questions with a classmate and compare answers.





N9

Number

L4MN

16

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Finding a percentage of a quantity:

Finding a percentage of a quantity can be done several ways.

Example: Find 20% of \$800.



One way this could be done is by finding 10% of the quantity first, then multiply by 2 as $2 \times 10\% = 20\%$.

Example: 10% of \$800 is \$80, therefore 20% would be $\$80 \times 2 = \160 .

A second way would be to convert the percentage to a decimal, then multiply the quantity by the decimal.

Example: $20\% = 0.2$, therefore $\$800 \times 0.2 = \160 .

Which way do you think is easier? Can you think of other ways of finding the percentage of a quantity?

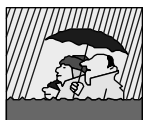
Task 24

Calculate the following percentages of these whole numbers.

- | | | | |
|---------------|---------------|---------------|---------------|
| 1. 50% of 40 | 2. 10% of 60 | 3. 10% of 36 | 4. 20% of 45 |
| 5. 40% of 90 | 6. 40% of 50 | 7. 60% of 56 | 8. 60% of 90 |
| 9. 20% of 54 | 10. 10% of 89 | 11. 70% of 80 | 12. 60% of 50 |
| 13. 25% of 60 | 14. 30% of 56 | 15. 25% of 72 | 16. 75% of 96 |
| 17. 75% of 48 | 18. 40% of 88 | 19. 60% of 54 | 20. 90% of 80 |

A new computer will cost \$2250 and can be purchased with a deposit.

- Calculate the deposit if 10% is required.
- How much is left to pay after the deposit has been paid?



During the past 30 days, the weather conditions were recorded.

- On 20% of the days it rained. Calculate the number of days it rained.
- On 40% of the days it was sunny. Calculate the number of sunny days.

During the holidays, Karen has been camping with her friends.

- On the first day they spent 25% of the day tramping to the camp site. Calculate the number of hours they spent tramping.
- On the second day, they spent 40% of the day resting. Calculate the number of hours they spent resting.

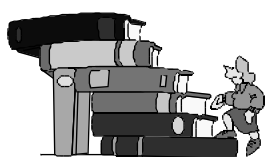


A school cross country race is run over a distance of 5400m.

- If Rangi has completed 60% of the course, calculate how far he has run so far.
- How far does Rangi have left to run? Give your answer as a percentage of the total distance and state the distance he has left to run.

A 36m long fence around a swimming pool is to be painted.

- If 75% of the fence has already been painted, calculate the length of the fence that has been painted.
- What percentage of the fence has yet to be painted?



In the school library there are 480 books.

- If 60% of the books are suitable for pupils 9 years old or younger, calculate how many books that is.
- If 35% of the books are fiction, calculate how many books that is.

- Create word problems involving finding percentages of a quantity. Exchange your questions with a classmate and compare answers.





N10

Number

L4MN

17

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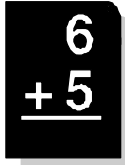
Adding, subtracting and multiplying with accuracy:

When you are adding, subtracting or multiplying without the use of a calculator, setting out correctly is most important.

Example: $256 + 9 + 75 + 1368 = ?$

$5000 - 2394 = ?$

$256 \times 56 = ?$



Lining up the digits will help when adding or subtracting.

$$\begin{array}{r} 256 \\ 9 \\ 75 \\ + 1368 \\ \hline \end{array}$$

$$\begin{array}{r} 5000 \\ - 2394 \\ \hline \end{array}$$

$$\begin{array}{r} 256 \\ \times 56 \\ \hline \\ \hline \\ \hline \end{array}$$

When multiplying, allow lines for each row of digits.

Lining up digits will help when adding up columns of digits.

Task 25

Copy each question below and **show all working** as you answer each question. Do not use a calculator.

1.
$$\begin{array}{r} 3569 \\ 133 \\ 9 \\ + 958 \\ \hline \end{array}$$

2.
$$\begin{array}{r} 8 \\ 4968 \\ 963 \\ + 27 \\ \hline \end{array}$$

3.
$$\begin{array}{r} 456 \\ 94 \\ 4862 \\ + 18 \\ \hline \end{array}$$

4.
$$\begin{array}{r} 5329 \\ - 3897 \\ \hline \end{array}$$

5.
$$\begin{array}{r} 10000 \\ - 9862 \\ \hline \end{array}$$

6.
$$\begin{array}{r} 348 \\ \times 24 \\ \hline \end{array}$$

7.
$$\begin{array}{r} 23945 \\ \times 67 \\ \hline \end{array}$$

8.
$$\begin{array}{r} 64098 \\ \times 98 \\ \hline \end{array}$$

9.
$$\begin{array}{r} 9403 \\ \times 246 \\ \hline \end{array}$$

10.
$$\begin{array}{r} 53241 \\ \times 356 \\ \hline \end{array}$$

Rewrite the information within each word problem below, as above, before you answer them.

In a local car sales yard there are several cars. The prices are listed below.

\$16950, \$9950, \$12500, \$8700, \$21500, \$13650, \$9500, \$17600



11. **Calculate** the total value of these cars.

Mr Williamson won \$100000 in Lotto.

12. If he bought a new car worth \$21700, calculate how much money he has left.

He then buys some new carpet costing \$7450 for his house.

13. **Calculate** how much money he now has left.



A large business is to replace its computers with the latest models.

Each computer will cost \$2450.

14. **Calculate** the value of the computers if 27 new computers are purchased.

15. If the business had planned to spend \$70000 on computers, **calculate** how much money they will have left after purchasing the 27 computers.



A school bus travels 149km each day of the school week.

16. **Calculate** the distance the school bus would travel if it makes the same trip for 40 weeks of the year, Monday to Friday.

17. **Create** word problems involving **adding, subtracting or multiplying** large numbers. **Exchange** your questions with a classmate and compare answers.



**N11**

Number

L4MN

18Please **DO NOT** write on the sheetsPlease **DO NOT** write on the sheets

Order of operations:

When working out answers with questions involving a mixture of operations, the order in which they are done will affect the answer. The letters **BODMAS** or **BEDMAS** will help you to remember the order.

B = brackets
O = of (**E** = exponents)
D = division
M = multiplication
A = addition
S = subtraction

This order means that you work out the **brackets first**, followed by ...

multiplying and **dividing** in the order they appear from left to right, followed by ...

adding or **subtracting** in the order they appear from left to right.

Examples: $6 \times 8 + 12$
 $= 48 + 12$
 $= 60$

$13 + 4 \times 3$
 $= 13 + 12$
 $= 25$

$36 \div 4 - 7$
 $= 9 - 7$
 $= 2$

$10 + 27 \div 9$
 $= 10 + 3$
 $= 13$



Task 26

Calculate the following.

1. $7 \times 8 + 10$

2. $9 \times 8 - 12$

3. $11 + 5 \times 7$

4. $32 \div 8 + 12$

5. $45 \div 5 - 7$

6. $9 \times 7 + 17$

7. $15 + 48 \div 6$

8. $55 - 7 \times 4$

9. $24 - 3 \times 6$

10. $72 \div 12 + 9$

11. $3 \times 12 + 11$

12. $12 + 21 \div 7$

13. $84 \div 7 + 13$

14. $9 \times 6 + 21$

15. $19 + 54 \div 9$

16. $63 - 9 \times 5$

17. $7 \times 9 - 37$

18. $96 \div 8 + 13$

19. $9 \times 11 - 43$

20. $10 \times 7 + 23$

21. $37 + 55 \div 11$

22. $70 - 6 \times 7$

23. $12 \times 5 + 19$

24. $108 \div 9 + 23$

25. $75 \div 5 - 12$

26. $72 - 9 \times 5$

27. $10 \times 6 + 29$

28. $96 \div 3 - 27$

29. $37 - 7 \times 5 + 11$

30. $11 + 15 \div 3 + 13$

31. $21 + 9 \times 4 - 12$

32. $18 + 42 \div 7 - 12$

33. $6 \times 8 \div 12 + 26$

34. $30 \div 5 \times 5 + 16$

35. $20 + 5 \times 4 \div 10$

36. $64 - 24 \div 8 \times 9$

37. $9 \times 8 - 7 \times 7$

38. $4 \times 5 + 12 \div 3$

39. $7 \times 4 - 3 \times 6$

40. $28 \div 7 + 6 \times 5$

Problems involving brackets.

Example: $3(5 + 4)$ means $3 \times (5 + 4) = 3 \times 9 = 27$

$5(20 - 3 \times 6) = 5(20 - 18) = 5 \times 2 = 10$

Use **order of operation** rules to work out the answers for these questions involving brackets.

41. $2(3 \times 4 + 5)$

42. $3(4 \times 6 - 12)$

43. $5(20 - 3 \times 6)$

44. $6(27 \div 9 + 7)$

45. $4(35 \div 5 - 3)$

46. $7(5 \times 3 + 4)$

47. $2(24 \div 6 + 3)$

48. $8(40 - 4 \times 9)$

49. $9 + 2(15 - 2 \times 6)$

50. $20 - 2(15 \div 3 + 1)$

51. $12 + 3(3 \times 4 + 5)$

52. $40 - 4(3 + 16 \div 4)$

Copy and **complete** each statement by **replacing** the **◆** with **+**, **-**, ***** or **÷** to make each statement true.

53. $2 \text{ ◆ } 3 \text{ ◆ } 5 = 11$

54. $5 \text{ ◆ } 3 \text{ ◆ } 6 = 9$

55. $10 \text{ ◆ } 4 \text{ ◆ } 2 = 18$

56. $12 \text{ ◆ } 3 \text{ ◆ } 7 = 11$

57. $3 \text{ ◆ } 10 \text{ ◆ } 2 = 8$

58. $20 \text{ ◆ } 3 \text{ ◆ } 5 = 5$

59. $7 \text{ ◆ } 12 \text{ ◆ } 2 = 13$

60. $3 \text{ ◆ } 3 \text{ ◆ } 4 = 13$

61. $15 \text{ ◆ } 15 \text{ ◆ } 3 = 10$

62. $18 \text{ ◆ } 6 \text{ ◆ } 7 = 10$

63. $4 \text{ ◆ } 3 \text{ ◆ } 6 = 22$

64. $14 \text{ ◆ } 6 \text{ ◆ } 2 = 11$

65. **Create** 10 questions as above, where the operation signs are missing.

Exchange your questions with a classmate and have him / her add signs to make each statement true.

'In-class' Worksheet

Teaching Notes & Answers

How to use this section:

Teaching notes are enclosed in a box with a 'push-pin' at the top left corner. The teaching notes precede the answers for each worksheet / task. The teaching notes have been included to provide assistance and background information about each topic or unit of work.

Introduction:

The topic of **Number** is concerned with exploring number, gaining an understanding of the meaning of negative numbers and special numbers such as prime numbers, factors, multiples, squares, square roots and other powers. The ability to convert between fractions, decimals and percentages is explored, plus activities involving the finding of fractions and percentages of a quantity. Being able to estimate quickly and accurately and checking the reasonableness of the answer is a useful skill that is explored. The setting out, and successful completion of addition, subtraction and multiplication problems involving decimals is also investigated, leading into the conventions for the order of operations.

The importance of gaining a good understanding of the 'basic number facts', the ability to add, subtract, divide and multiply with confidence, should not be underestimated, as all strands of mathematics involve some, if not all, of the four basic skills.



Worksheets 1 & 2

Adding and subtracting whole numbers:
Multiplying and dividing whole numbers:
Special numbers:

In **Tasks 1 & 2**, pupils are to copy two number crosses, then complete some addition or subtraction and multiplication or division problems as a revision activity. The copying of the number crosses is also an important skill.

In **Tasks 3 & 4**, pupils are to complete sentences about definitions of the special numbers; **factors**, **multiples**, **prime numbers** and **prime factors**. Pupils are then to work with each group to consolidate their understanding of the properties of these numbers.

Task 1

1. & 2.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | 7 | 3 | | 4 | 2 | 9 | 7 |
| 2 | | 5 | 2 | 1 | | 0 | |
| 9 | 2 | | | 9 | | 4 | 9 |
| | 1 | | 9 | 1 | 2 | | 5 |
| 2 | 5 | 7 | | | 7 | 5 | 8 |
| 4 | 4 | 2 | 5 | | 5 | | 7 |
| 9 | | | 7 | 5 | 2 | 4 | 0 |

Task 2

1. & 2.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 7 | 5 | | 2 | 4 | 6 | 0 |
| 2 | | 2 | 4 | 0 | | 1 | |
| 4 | 9 | | | 1 | | 9 | 3 |
| | 6 | | 3 | 6 | 8 | | 1 |
| 1 | 2 | 7 | | | 5 | 7 | 6 |
| 2 | 4 | 1 | 8 | | 9 | | 9 |
| 7 | | | 1 | 2 | 0 | 2 | 0 |

Note:

A **prime number** has only two factors - itself and 1.
2 is the only even prime number.
1 is not a prime number.

Task 3

1. prime 2. multiple 3. factor 4. prime factor 5. 2, 3, 5, 7, 11, 13, 17, 23, 29, 31
6. 41, 43, 47 7. 5, 11, 23, 31, 37, 89 8. 2 + 5 9. 2 + 13 10. 5 + 23, 11 + 17 11. 3 + 29, 13 + 19
12. 11 + 29, 17 + 23 13. 5 + 43, 7 + 41, 11 + 37, 17 + 31 14. 5, 10, 15, 20, 25, 30, 35, 40, 45, 50
15. 9, 18, 27, 36, 45, 54, 63, 72, 81, 90 16. 12, 24, 36, 48, 60, 72, 84, 96, 108, 120
17. 15, 30, 45, 60, 75, 90, 105, 120, 135, 150 18. 19, 38, 57, 76, 95, 114, 133, 152, 171, 190

19. 23, 46, 69, 92, 115, 138, 161, 184, 207, 230 20. 8, 16, 24, 32, 40 21. 21, 28, 35, 42, 49, 56
 22. 39, 52, 65, 78 23. 1, 2, 3, 6 24. 1, 2, 5, 10 25. 1, 2, 3, 6, 9, 18 26. 1, 2, 3, 4, 6, 8, 12, 24
 27. 1, 3, 9, 27 28. 1, 2, 3, 4, 6, 9, 12, 18, 36 29. $2 \times 7 = 14$ 30. $7 \times 11 = 77$ 31. $5 \times 7 = 35$
 32. $5 \times 13 = 65$ 33. $3 \times 17 = 51$ 34. $5 \times 17 = 85$

Task 4

1. 35 2. 54

Worksheets 3 to 5

Understanding negative numbers:
Understanding and using number lines:
More negative numbers:
Bank overdrafts:

In **Task 5**, pupils are introduced to **negative numbers**, by way of everyday events that can be represented as negative numbers. Calculations involving temperature changes is a particularly good way to introduce negative numbers as weather forecasts include the likelihood of frosts, thus highlighting the use of negative numbers.

In **Task 6**, pupils are introduced to **number lines** that include negative numbers. Pupils should be familiar with number lines as they form part of x-y graphs. Using the number line, including negative numbers, pupils are to add positive and negative number together. Adding a negative number results in a movement to the left along the number line. The starting point on the number line is the first number that is in the question.

In **Task 7**, small groups of pupils are to play a number game with a die (dice). The odd numbers on the die are negative and the even numbers are positive. Pupils are to keep a running total as they roll the die 5 times. The pupil with the lowest score wins.

In **Task 8**, pupils are to further develop their understanding of negative numbers as they add larger positive and negative numbers.

In **Task 9**, pupils are to calculate a running total of a bank balance that goes in and out of overdraft. This task is a good example of negative numbers in daily use. On a bank statement, a debit balance is negative and a credit balance is positive.

Task 5

1. 5, 4, 3, 2, 1, 0, -1, -2 2. -1 3. 3 4. 9m 5. 3m, 6m, 10m 6. -2m, -4m, -7m, -9m 7. -5m
 8. -3m 9. 4°C 10. 2°C 11. 7°C 12. -4°C 13. -7°C 14. 5°C 15. -8°C 16. -7°C 17. 3°C
 18. -6°C 19. -8°C 20. -2°C 21. 0°C

Task 6

1. 6 2. -4 3. -4 4. -3 5. -9 6. -9 7. 4 8. -3 9. 1 10. 2 11. -1 12. -3
 13. -1 14. -3 15. 6 16. -4 17. 9 18. -6 19. 7 20. -6 21. 5 22. -9 23. -11
 24. -11 25. -8 26. 11 27. 10 28. -8 29. -11 30. -9 31. -11

Task 8

1. $5 + -6 = -1$ 2. $7 + -3 = 4$ 3. $5 + -7 = -2$ 4. $7 + -7 = 0$ 5. 1 6. -3 7. -1 8. 3 9. 3
 10. 2 11. -6 12. 1 13. 4 14. 0 15. 5 16. -1 17. -2 18. -1 19. 3 20. 4 21. -3
 22. -3 23. -4 24. 96 25. -8 26. -25 27. -9 28. -41 29. -5

Task 9

1. Opening balance = \$250, 1st transaction balance = -\$45.00 (overdraft),
 2nd transaction balance = \$40.60, 3rd transaction = -\$35.30, final transaction = \$52.20

Squares & square roots:
Cubes and other powers:

In **Task 10**, pupils are to calculate the squares and square roots of various numbers. A calculator may be necessary when finding the square root of large numbers. The important point to stress is that for any square, such as 3^2 means the number is multiplied by itself, that is 3×3 and not 3×2 .

In **Task 11**, pupils are to calculate cubes and other powers of various numbers.

Example: $3^4 = 3 \times 3 \times 3 \times 3 = 81$

Task 10

1. 36 2. 81 3. 144 4. 100 5. 25 6. 49 7. 64 8. 225 9. 400 10. 900 11. 10000
12. 2500 13. 40000 14. 1000000 15. 62500 16. 11.56 17. 53.29 18. 21.16 19. 34.81
20. 7.84 21. 0.81 22. 0.0625 23. 0.7225 24. 0.0144 25. 2.3716 26. 8 27. 4 28. 9
29. 11 30. 7 31. 5 32. 12 33. 15 34. 3 35. 30 36. 10 37. 14 38. 17 39. 40
40. 50

Task 11

1. 3^5 2. 4^3 3. 5^6 4. 7^3 5. 9^4 6. 10^6 7. 12^3 8. 20^5 9. 27 10. 64 11. 125
12. 1000 13. 16 14. 32 15. 64 16. 243 17. 343 18. 729 19. 1296 20. 6561
21. 4096 22. 10000 23. 3125

Equivalent fractions:

In **Task 12**, pupils are to explore equivalent fractions. A fraction of a group of diagrams has been shaded and pupils express the shaded diagrams as a fraction of the group and then match equivalent fractions. A series of progressive exercises guide pupils through the process of working out, matching and creating equivalent fractions. Some large fraction can be simplified to create smaller equivalent fractions. This can be done by dividing the numerator and denominator by the same number.

Task 12

1. $A = \frac{1}{2}$, $B = \frac{4}{10}$, $C = \frac{3}{5}$, $D = \frac{3}{6}$, $E = \frac{6}{10}$, $F = \frac{2}{3}$, $G = \frac{2}{5}$, $H = \frac{6}{9}$ 2. $\frac{1}{2} = \frac{3}{6}$, $\frac{2}{3} = \frac{6}{9}$,
 $\frac{2}{5} = \frac{4}{10}$, $\frac{3}{5} = \frac{6}{10}$ 3. $\frac{5}{20}$ 4. $\frac{8}{16}$ 5. $\frac{5}{25}$ 6. $\frac{4}{28}$ 7. $\frac{8}{28}$ 8. $\frac{14}{21}$ 9. $\frac{21}{56}$ 10. $\frac{25}{40}$
11. $\frac{9}{24}$ 12. $\frac{20}{45}$ 13. $\frac{18}{33}$ 14. $\frac{33}{77}$ 15. 2 16. 5 17. 3 18. 4 19. 4 20. 9 21. 8
22. 6 23. 8 24. 25 25. 10 26. 2 27. 3 28. 1 29. 1 30. $\frac{8}{32}$ 31. $\frac{17}{34}$ 32. $\frac{12}{18}$
33. $\frac{12}{20}$ 34. $\frac{30}{36}$ 35. $\frac{45}{60}$ 36. $\frac{9}{24}$ 37. $\frac{16}{28}$ 38. $\frac{15}{27}$

Expressing a fraction as a decimal:
Expressing a decimal as a fraction:
Expressing a decimal as a percentage:
Expressing a percentage as a decimal:

In **Task 13**, pupils are to convert fractions to decimals by dividing the numerator by the denominator. Setting out the division problem correctly is important and zeros are added after the decimal point, with the division continuing until there is no remainder or a repeating pattern is found, indicated by a small dot to the top right of the repeating digit(s). Pupils are to explore the decimal patterns created when various fractions are converted to decimals.

In **Task 14**, pupils are to perform the opposite conversion, decimals to fractions, which is less difficult as the denominator will be 10, 100, 1000, etc. depending on the number of digits after the decimal points. The fractions created will be either $\frac{1}{10}$'s, $\frac{1}{100}$'s, $\frac{1}{1000}$'s or $\frac{1}{10000}$'s etc.

Example: $0.5 = \frac{5}{10}$, $0.05 = \frac{5}{100}$, $0.005 = \frac{5}{1000}$, $0.0005 = \frac{5}{10000}$



In **Task 15**, pupils are to convert decimals to percentages. As percentages are out of 100, this can be done by multiplying the decimal by 100, that is, move the decimal point two places to the right.

In **Task 16**, pupils are to convert percentages to decimals. This can be done by dividing the percentage by 100, resulting in the decimal point moving two places to the left. Remind pupils that if there is no decimal point shown in a number, then the decimal point will be at the right hand end of the number. *Example:* 65% has the decimal point after the 5, that is, 65.0%.

In **Task 17**, pupils are to test their skills at converting between fractions, decimals and percentages, as they match examples of fractions, decimals and percentages.

Task 13

1. 0.25 2. 0.375 3. 0.1 4. 0.4 5. 0.625 6. 0.8 7. 0.05 8. 0.8 9. 0.5 10. 0.3
11. 0.6 12. 0.75 13. 0.3̇ 14. 0.7 15. 0.5 16. 0.25 17. 0.75 18. 0.6 19. 0.6̇
20. 0.6
21. $\frac{1}{11} = 0.090\bar{9}$, $\frac{2}{11} = 0.181\bar{8}$, $\frac{3}{11} = 0.272\bar{7}$, $\frac{4}{11} = 0.363\bar{6}$, $\frac{5}{11} = 0.454\bar{5}$, $\frac{6}{11} = 0.545\bar{4}$,
 $\frac{7}{11} = 0.636\bar{3}$, $\frac{8}{11} = 0.727\bar{2}$, $\frac{9}{11} = 0.818\bar{1}$, $\frac{10}{11} = 0.909\bar{0}$,

Note that pairs of numbers in each decimal add to 9

22. $\frac{1}{9} = 0.111\bar{1}$, $\frac{2}{9} = 0.222\bar{2}$, $\frac{3}{9} = 0.333\bar{3}$, $\frac{4}{9} = 0.444\bar{4}$, $\frac{5}{9} = 0.555\bar{5}$, $\frac{6}{9} = 0.666\bar{6}$,
 $\frac{7}{9} = 0.777\bar{7}$, $\frac{8}{9} = 0.888\bar{8}$,

23. $\frac{1}{7} = 0.142857$, $\frac{2}{7} = 0.285714$, $\frac{3}{7} = 0.428571$, $\frac{4}{7} = 0.571428$, $\frac{5}{7} = 0.714285$, $\frac{6}{7} = 0.857142$,
 Note the the first 6 digits after the decimal point for each fraction are the same, but in a different order. For each, the 6 digits repeat in the same order.

Task 14

1. $\frac{9}{10}$ 2. $\frac{9}{100}$ 3. $\frac{9}{1000}$ 4. $\frac{23}{100}$ 5. $\frac{14}{1000}$ 6. $\frac{12}{100}$ 7. $\frac{3}{10}$ 8. $\frac{302}{1000}$ 9. $\frac{42}{100}$ 10. $\frac{3}{10}$
11. $\frac{345}{1000}$ 12. $\frac{234}{10000}$ 13. $\frac{95}{100}$ 14. $\frac{8}{10}$ 15. $\frac{69}{100}$ 16. $\frac{8}{10}$ 17. $\frac{635}{1000}$ 18. $\frac{7}{10}$
19. $\frac{309}{1000}$ 20. $\frac{5}{10000}$ 21. $\frac{94}{100}$ 22. $\frac{7}{100}$ 23. $\frac{903}{1000}$ 24. $\frac{63}{100}$ 25. $\frac{625}{1000}$

Task 15

1. 25% 2. 9% 3. 6% 4. 15% 5. 1.4% 6. 19% 7. 30% 8. 65% 9. 42% 10. 95%
11. 34.5% 12. 45% 13. 9.5% 14. 80% 15. 60% 16. 75% 17. 63.5% 18. 70%
19. 30.9% 20. 1% 21. 4.5% 22. 130% 23. 2.65% 24. 3.5% 25. 6.5%

Task 16

1. 0.65 2. 0.5 3. 0.09 4. 0.15 5. 0.45 6. 0.87 7. 0.55 8. 1.00 9. 0.17 10. 0.05
11. 0.52 12. 0.4 13. 0.93 14. 0.8 15. 0.23 16. 0.75 17. 0.66 18. 0.3 19. 0.375
20. 0.805 21. 0.018 22. 1.4 23. 2.35 24. 1.37 25. 3.06

Task 17

| Fraction | Decimal | Percentage |
|---------------|---------|------------|
| $\frac{1}{4}$ | 0.25 | 25% |
| $\frac{1}{3}$ | 0.3̇ | 33.3% |
| $\frac{2}{5}$ | 0.4 | 40% |
| $\frac{1}{2}$ | 0.5 | 50% |
| $\frac{2}{3}$ | 0.6̇ | 66.6% |
| $\frac{3}{4}$ | 0.75 | 75% |

Expressing a quantity as a fraction or percentage of a whole:

In **Task 18**, pupils are to express quantities as fractions or percentages of a whole, using the methods outlined on the worksheet. Using items within the classroom, similar questions can be created.

Example: What fraction of the classroom windows are along the top of the classroom?

What percentage of the class has an apple in their lunch today?

Task 18

1. $\frac{1}{5}$ or 20%
2. $\frac{3}{4}$ or 75%
3. $\frac{2}{5}$ or 40%
4. $\frac{2}{6}$ or 33.3%
5. $\frac{21}{25}$
6. $\frac{31}{250}$
7. $\frac{29}{50}$
8. $\frac{5}{7}$
9. -
10. $\frac{2}{7}$
11. $\frac{80}{100} = 0.8 = 80\%$
12. $\frac{25}{100} = 0.25 = 25\%$
13. $\frac{24}{50} = \frac{48}{100} = 0.48 = 48\%$
14. $\frac{15}{20} = \frac{75}{100} = 0.75 = 75\%$
15. $\frac{7}{25} = \frac{28}{100} = 0.28 = 28\%$
16. $\frac{2}{3} = \frac{66}{100} = 0.66 = 66.6\%$
17. $\frac{35}{50}$, 70%
18. $\frac{3}{4}$, 75%
19. 25%, $\frac{1}{4}$

Worksheets 11 & 12**Rounding numbers and finding estimates:****Estimating totals involving money:**

In **Task 19**, pupils are to round numbers to the nearest 10, 100 or 1000 as requested. Note that when rounding, 5's round up. *Example:* 25 rounds to 30, 150 rounds to 200, 1500 rounds to 2000 etc. If rounding decimals, the same procedure is used. *Example:* 1.5 rounds to 2.0, 1.75 rounds to 1.8 etc. Pupils are to estimate totals by rounding numbers and then check how accurate their estimates were by calculating the exact totals. Rounding / estimating is a useful skill, especially as pupils tend to believe answers they get on a calculator. By having an understanding of and the ability to estimate, calculator errors can be picked up. Word problems involving finding estimates and actual totals are included.

In **Task 20**, pupils are to estimate the cost of various shopping lists and check the reasonableness of their estimates by calculating the exact costs. Pupils are to create their own shopping lists to exchange with classmates, so that the estimates and actual cost of the lists can be worked out.

Task 19

1. 30
2. 50
3. 90
4. 70
5. 130
6. 140
7. 180
8. 230
9. 270
10. 340
11. 100
12. 100
13. 300
14. 700
15. 900
16. 1300
17. 1600
18. 3200
19. 4400
20. 5100
21. 4000
22. 2000
23. 6000
24. 8000
25. 3000
26. 7000
27. 8000
28. 7000
29. 10000
30. 9000
31. $100 + 200 = 300$
32. $600 - 200 = 400$
33. $80 \times 30 = 2400$
34. $500 \div 10 = 50$
35. $1200 \times 20 = 24000$
36. $10000 + 3000 = 13000$
37. $5000 \div 10 = 500$
38. $6000 - 4000 = 2000$
39. 281, 385, 2686, 55, 27278, 12717, 456, 2257
40. $150 + 200 + 90 + 110 + 170 + 130 + 190 = 1040\text{km}$
41. 1041km
42. $1000 \times \$0.60 = \600 , \$593.37
43. $20 + 30 + 10 + 20 + 40 + 30 + 10 + 20 + 30 + 40 = 250$ minutes
44. 244 minutes
45. $250 \times \$0.2 = \50.00 , \$53.68

Task 20

1. $4 \times \$2 = \8
2. $2 \times \$2 = \4
3. $3 \times \$4 = \12
4. List A: $\$4 + \$3 + \$2 + \$4 + \$5 = \18
- List B: $\$6 + \$3 + \$6 + \$4.50 + \$8 = \27.50
- List C: $\$6 + \$6 + \$4 + \$8 + \$6 = \30
- List D: $\$4 + \$12 + \$6 + \$6 + \$10 = \38
- List E: $\$12 + \$15 + \$8 + \$2 + \$6 + \$3 = \$46$
- List F: $\$9 + \$4 + \$9 + \$10 + \$4.50 + \$2 = \$38.50$
- List G: $\$8 + \$9 + \$12 + \$2 + \$10 + \$9 = \$50$
- List H: $\$16 + \$4.50 + \$9 + \$5 + \$9 + \$15 = \$58.50$
5. List A: $\$3.80 + \$2.70 + \$2.45 + \$3.95 + \$4.60 = \17.50
- List B: $\$5.90 + \$3.10 + \$5.80 + \$4.20 + \$7.30 = \26.30
- List C: $\$5.70 + \$5.90 + \$3.60 + \$7.90 + \$6.20 = \29.30
- List D: $\$4.90 + \$11.85 + \$6.20 + \$5.80 + \$9.20 = \37.95
- List E: $\$11.80 + \$13.80 + \$7.30 + \$2.45 + \$5.70 + \$2.70 = \$43.75$
- List F: $\$8.70 + \$3.95 + \$9.30 + \$9.20 + \$4.20 + \$1.80 = \$37.15$

- List G: $\$7.60 + \$8.85 + \$12.40 + \$2.45 + \$9.20 + \$8.70 = \$49.20$
List H: $\$15.80 + \$4.35 + \$8.40 + \$4.50 + \$9.30 + \$13.80 = \$56.15$

Worksheet 13

Multiplying and dividing by powers of 10:

In **Task 21**, pupils are to multiply and divide by powers of 10, the first 4 are listed on the worksheet. The aim is for pupils to come up with simple rules that involve moving the decimal point left or right, a number of spaces based on the number of zeros in the power of 10, therefore the actual calculation does not need to be done. Remind pupils where the decimal points are, if they are not shown. This task introduces the concept of standard form, that will be explored at level 5 and above. *Example:* 1.2×10^4 , 3.93×10^{-2} Word problems are included.

Task 21

- 530
- 7700
- 8400
- 600
- 19000
- 637
- 943000
- 80500
- 56200
- 70
- 1940
- 5.9
- 26000
- 1500
- 96000
- 520000
- Shift the decimal point **right**, by the same number of places as there are zeros in the power of 10.
- 0.63
- 0.0051
- 0.97
- 0.165
- 0.0038
- 0.0427
- 0.01238
- 0.001205
- 7.12
- 0.00027
- 0.00187
- 0.53
- 0.0096
- 0.047
- 0.00015
- 0.033
- Shift the decimal point **left**, by the same number of places as zeros in the power of 10.
- 3950
- 0.0625
- 962000
- 0.03091
- 26800
- 9346000
- 0.000275
- 978500
- 800 plants
- 2.5 rows
- \$25
- 60 cents each
- \$2500
- 40 cents each
- \$150000
- \$2

Worksheet 14

Multiplying and dividing decimals:

In **Task 22**, pupils are to multiply and divide decimals, utilising skills they have learnt over the past few years. Setting out is important and the correct setting out will help to avoid errors.

Task 22

- 26.784
- 242
- 28.74
- 137.1
- 2524
- 13.587
- 55.7
- 11.616
- 68.3
- 56.24
- 92.125
- 63.9
- 7.428
- 19.968
- 2.3808
- 10.88
- 6523
- 0.407375
- 5296
- 0.002772
- \$8783.60, \$15371.30, \$26350.80
- \$0.015
- \$10.50, \$15.00, \$22.50
- 87.56km
- 1267.95km
- \$57.75
- 75km, 187.5km, 375km
- 5197.5 seconds
- 86.625 minutes

Worksheets 15 & 16

Finding a fraction of a quantity:

Finding a percentage of a quantity:

In **Task 23**, pupils are to find fractions of a quantity. This can be done by dividing the quantity by the denominator and then multiplying that answer by the numerator. Word problems are included and pupils are to create and exchange word problems among themselves.

In **Task 24**, pupils are to find percentages of a quantity. This can be done using either of the two ways illustrated on the worksheet. Word problems are included and pupils are to create and exchange word problems among themselves.

Task 23

- 10
- 12
- 6
- 5
- 9
- 16
- 21
- 12
- 30
- 49
- 54
- 10
- 50
- 49
- 54
- 60
- 30
- 64
- 45
- 63
- 8 pupils
- 7 pupils
- 6 days
- 18 days
- 9hrs
- 10hrs
- 3780m
- $\frac{3}{10}$, 1620m
- 15m
- $\frac{7}{12}$

31. 160 books 32. 200 books 33. 180 books

Task 24

1. 20 2. 6 3. 3.6 4. 9 5. 36 6. 20 7. 33.6 8. 54 9. 10.8 10. 8.9 11. 56
 12. 30 13. 15 14. 16.8 15. 18 16. 72 17. 36 18. 35.2 19. 32.4 20. 72
 21. \$225 22. \$2025 23. 6 days 24. 12 days 25. 6hrs 26. 9.6hrs 27. 3240m
 28. 40%, 2160m 29. 27m 30. 25% 31. 288 books 32. 168 books



Worksheet 17

Adding, subtracting and multiplying with accuracy:

In **Task 25**, pupils are to revisit the basic adding, subtracting and multiplying skills they should have developed over the past few years. Setting out the questions neatly with assist at avoiding making mistakes. Pupils should be able to explain the methods they are using.

Task 25

1. 4669 2. 5966 3. 5430 4. 1432 5. 138

$$\begin{array}{r} 6. \quad \quad 348 \\ \quad \quad \times 24 \\ \hline \quad \quad 1392 \\ \quad \quad 6960 \\ \hline \quad \quad 8352 \end{array}$$

$$\begin{array}{r} 7. \quad \quad 23945 \\ \quad \quad \times 67 \\ \hline \quad \quad 167615 \\ \quad \quad 1436700 \\ \hline \quad \quad 1604315 \end{array}$$

$$\begin{array}{r} 8. \quad \quad 64098 \\ \quad \quad \times 98 \\ \hline \quad \quad 512784 \\ \quad \quad 5768820 \\ \hline \quad \quad 6281604 \end{array}$$

$$\begin{array}{r} 9. \quad \quad 9403 \\ \quad \quad \times 246 \\ \hline \quad \quad 56418 \\ \quad \quad 376120 \\ \quad \quad 1880600 \\ \hline \quad \quad 2313138 \end{array}$$

$$\begin{array}{r} 10. \quad \quad 53241 \\ \quad \quad \times 356 \\ \hline \quad \quad 319446 \\ \quad \quad 2662050 \\ \quad \quad 15972300 \\ \hline \quad \quad 18953796 \end{array}$$

11. \$110350 12. \$78300 13. \$70850 14. \$66150 15. \$3850 16. 5960km



Worksheet 17

Order of operations:

In **Task 26**, pupils are to use the order of operation convention to calculate answers. The letters **BODMAS** or **BEDMAS** are a good way to remember the order of doing the calculation. At this level, problems involving exponent (powers) have been left out.

The order implies the following ...

1. Look for brackets. If brackets are there, work out what is inside the brackets first.
Example: $21 + (4 + 3 \times 6)$
2. Look for multiplication and division next and work out each one out, as you read from left to right. Both are of equal importance. The order in which they are written in BODMAS or BEDMAS **DOES NOT** imply that dividing should be done before multiplying. At this point, only adding and / or subtracting will be left.
3. Look for addition and subtraction next and work these out in the order they appear as you read from left to right. Both are of equal importance. The order in which they are written in BODMAS or BEDMAS **DOES NOT** imply that adding should be done before subtracting.

The final part of the task has questions where the operation signs have been left out and pupils are to work out the missing signs, using the convention of order of operations.

Task 26

1. 66 2. 60 3. 46 4. 16 5. 2 6. 80 7. 23 8. 27 9. 6 10. 15 11. 47 12. 15
 13. 25 14. 75 15. 25 16. 18 17. 26 18. 25 19. 56 20. 93 21. 42 22. 28 23. 79
 24. 35 25. 3 26. 27 27. 89 28. 5 29. 13 30. 29 31. 45 32. 12 33. 30 34. 46
 35. 22 36. 37 37. 23 38. 24 39. 10 40. 34 41. 34 42. 36 43. 10 44. 60
 45. 16 46. 133 47. 14 48. 32 49. 15 50. 8 51. 63 52. 12

53. $2 \times 3 + 5 = 11$ 54. $5 \times 3 - 6 = 9$ 55. $10 + 4 \times 2 = 18$ 56. $12 \div 3 + 7 = 11$ 57. $3 + 10 \div 2 = 8$
58. $20 - 3 \times 5 = 5$ 59. $7 + 12 \div 2 = 13$ 60. $3 \times 3 + 4 = 13$ 61. $15 - 15 \div 3 = 10$ 62. $18 \div 3 + 7 = 10$
63. $4 + 3 \times 6 = 22$ 64. $14 - 6 \div 2 = 11$

Table of Contents for the Homework / Assessment Worksheet Masters for Number, Level 4

| Worksheet Number | Topic | Number Objective(s) |
|---------------------|--|------------------------|
| 1 | Special numbers / Prime numbers / Multiples / Factors / Guess the number game | Revision |
| 2 | Positive and negative numbers / Temperature changes / Bank overdrafts / Number lines | N1 |
| 3 | Squares and square roots / Cubes / Other powers / Guess the number game | N2 |
| 4 | Diagrams and equivalent fractions / Creating equivalent fractions / Matching equivalent fractions | N3 |
| 5 | Expressing a fraction as a decimal / Expressing a decimal as a fraction / Expressing a decimal as a percentage / Expressing a percentage as a decimal | N4 / N5 |
| 6 | Converting between fractions, decimals and percentages / Expressing a quantity as a fraction of a whole / Expressing a quantity as a % of a whole / Word problems | N4 / N5 / N6 |
| 7 | Rounding and estimation / Word problems / Estimations involving money | N7 |
| 8 | Multiplying and dividing by powers of 10 / Multiplying and dividing decimals / Word problems | N8 |
| 9 | Finding a fraction of a quantity / Finding a percentage of a quantity / Word problems involving fractions and percentages | N9 |
| 10 | Adding, subtracting and multiplying / Order of operations / Order of operations involving brackets / Missing signs / Word problems | N10 / N11 |
| Answers | | |



Revision


Homework / Assessment Worksheet

Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'


- $14.7 + 21.6 =$
- $810 - 653 =$
- $495 \times 10 =$
- $320 \div 80 =$
- Name this shape 
- $\$4.90 \times 9 =$
- Write 25 minutes to 9 as digital time

| | |
|--|--|
| | |
|--|--|
- Find $\frac{1}{2}$ of \$14.30
.....
- How many kilometres in 8700m?
- What would 5 books at \$7.95 each cost?
.....

B: Special numbers

Complete these sentences using the words below.

factor, multiples, prime, prime factor

- A number can only be divided by two numbers, itself and 1.
- The of a number are found by multiplying the number by 1, 2, 3, 4, 5, etc and recording the answers.
- A of a given number is a whole number that divides exactly into the given number. There is no remainder. 
- A is a factor that is a prime number.

C: Prime numbers

Circle the prime numbers in this list below.

1, 2, 5, 6, 9, 11, 14, 15, 17, 19, 21, 23, 24, 29, 31, 33, 35, 37, 42, 45, 49, 51, 53, 59

D: Multiples

List the next six multiples for each number.

- 8,
- 6,
- 11,
- 7,
- 15,
- 20,
- 25,

List the multiples of 12 that are ...

- less than 50
- between 62 and 100

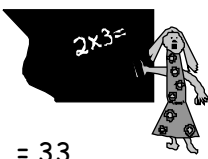
E: Factors

List the factors of the numbers listed below.

- 12
- 15
- 19
- 24
- 30

Write each number below as two prime factors.

Example: $2 \times 5 = 10$

- \times = 15
 - \times = 26
 - \times = 33
- 

F: Guess the number game

I am a prime number.
I am greater than 30,
but less than 45.
My digits add to 10.
What number am I?

1.

I am an even number.
I am greater than 40,
but less than 55.
I am a multiple of 9.
What number am I?

2.

I am an odd number.
I am greater than 10,
but less than 20.
I am a factor of 30.
What number am I?

3.

I am an odd number.
I am greater than 50,
but less than 70.
I am a multiple of 13.
What number am I?

4.



Comments:

Please sign:
Parent / Caregiver



Homework / Assessment Worksheet

N1

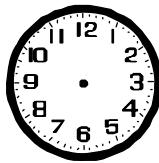
Name: _____

Class: _____

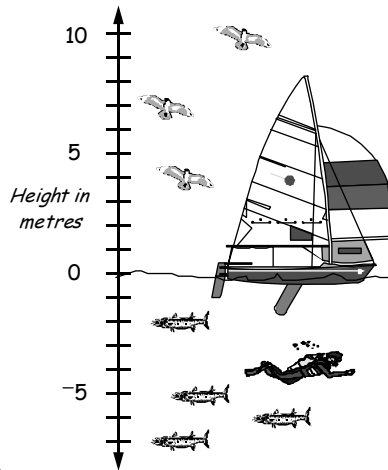
Complete by: _____

A: 10 'Quick Questions'

- $1983 + 934 =$
- $650 - 439 =$
- $624 \times 30 =$
- $850 \div 5 =$
- $\$17.40 + \$21.65 + \$1.10 =$
.....
- $\$4.25 \times 7 =$
- Draw
twenty-five
to 4
on this
clock face
- Find $\frac{1}{4}$ of $\$27.00$
.....
- How many metres in
6.9km?
- What would 7 books at
 $\$4.65$ each cost?
.....



B: Positive and negative numbers



State the position of the following as positive and negative numbers.

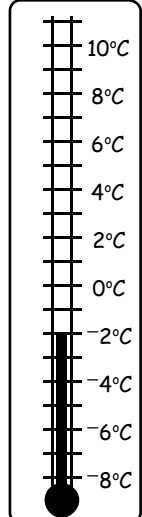
- The height of the top of the mast.
- The heights of the three birds.
.....,,
- The depths of the four fish.
.....,,,
- The depth of the diver.
.....

C: Temperature changes

The temperature scale is one of the most commonly used scales that uses negative numbers.

- What is the temperature shown on this diagram of a thermometer?
- What is the new temperature?

| Starting temperature | Change | New temperature |
|----------------------|----------------------------|-----------------|
| 2°C | drops 6°C | |
| -3°C | rises 8°C | |
| 9°C | drops 12°C | |
| -2°C | drops 6°C | |
| -8°C | rises 5°C | |



E: Bank overdrafts

Calculate each new balance of an account after the following transactions. The account has an opening balance of **\\$300**.

- Buys a new bike worth $\$450$.
new balance =
- Sells an old bed for $\$175$
new balance =
- Buys some new clothes worth $\$105$.
final balance =

F: Numbers game

Michelle rolls two dice three times, then adds the numbers.

Odd numbers = -1, -3, -5
Even numbers = 2, 4, 6

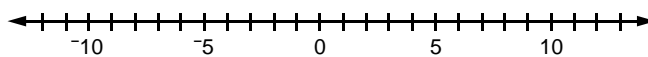


Calculate the total if these numbers appeared on the dice.

4, 5, 1, 6, 3, 3

D: Number lines

Number lines are used to represent positive and negative numbers and go on forever in both directions.



Add these positive and negative numbers together.

- $-3 + 5 =$
- $7 + -5 =$
- $6 + -9 =$
- $-5 + 9 =$
- $-10 + 6 =$
- $9 + -8 =$
- $7 + -10 =$
- $11 + -8 =$
- $-11 + 9 =$
- $-5 + 10 =$
- $12 + -8 =$
- $-13 + 10 =$
- $-4 + -5 =$
- $-3 + -8 =$



Comments:

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N2

NUMBER

Homework / Assessment Worksheet

L4MN

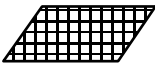


Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $17.9 + 34.9 =$
- $953 - 594 =$
- $236 \times 12 =$
- $490 \div 70 =$
- Name this shape 
- $\$6.30 \times 8 =$
- Write 10 minutes past 5 as digital time

| |
|---|
| : |
|---|

- Find 50% of \$9.58
.....
- How many kilograms in 7500g?
- What would 8 books at \$8.65 each cost?
.....

B: Squares and square roots

- The number 5 squared would be written as 5^2 , but what does it mean?

Calculate these squares.

- | | |
|------------------|------------------|
| 2. 4^2 | 3. 9^2 |
| 4. 8^2 | 5. 12^2 |
| 6. 11^2 | 7. 6^2 |
| 8. 13^2 | 9. 7^2 |
| 10. 5^2 | 11. 10^2 |
| 12. 17^2 | 13. 15^2 |
| 14. 25^2 | 15. 20^2 |
| 16. 40^2 | 17. 50^2 |

The opposite of squaring a number is to find the square root. Find the **square roots** of these numbers.

- | | |
|------------------------|------------------------|
| 18. $\sqrt{64}$ | 19. $\sqrt{16}$ |
| 20. $\sqrt{25}$ | 21. $\sqrt{144}$ |
| 22. $\sqrt{100}$ | 23. $\sqrt{81}$ |
| 24. $\sqrt{225}$ | 25. $\sqrt{400}$ |
| 26. $\sqrt{900}$ | 27. $\sqrt{196}$ |

C: Cubes

- What does 2^3 mean?
.....

Calculate the following cubes.

- 3^3
- 4^3
- 5^3
- 6^3
- 7^3
- 8^3
- 10^3
- 20^3

D: Other powers

If five to the power of six is written as 5^6 , write the following as numbers, without working out the answer ...

- three to the power of four
- seven to the power of five
- nine to the power of six



Calculate the following.

- | | |
|----------------|-----------------|
| 4. 2^4 | 5. 3^4 |
| 6. 2^5 | 7. 5^4 |
| 8. 2^8 | 9. 10^4 |

E: Guess the number game

I am a number squared.
I am greater than 45,
but less than 70.
My digits add to 13.
What number am I?

1.

I am a number squared.
I am greater than 70,
but less than 100.
My digits add to 9.
What number am I?

2.

I am a number cubed.
I am greater than 20,
but less than 50.
I am a multiple of 9.
What number am I?

3.

I am a number cubed.
I am greater than 90,
but less than 140.
I am a multiple of 5.
What number am I?

4.



Comments:

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N3

NUMBER

Homework / Assessment Worksheet

L4MN



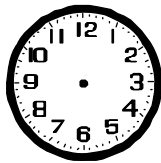
Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

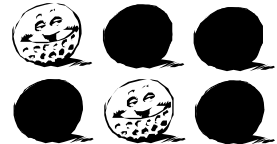
- $1956 + 724 =$
- $890 - 592 =$
- $629 \times 80 =$
- $840 \div 5 =$
- $\$12.40 + \$19.67 + \$1.05 =$
- $\$4.25 \times 8 =$
- Draw twenty past 8 on this clock face
- Find $\frac{1}{4}$ of $\$38.00$
- How many millimetres in 57cm?
- What would 9 books at $\$9.25$ each cost?



B: Diagrams and equivalent fractions

A fraction of each set of diagrams has been shaded.

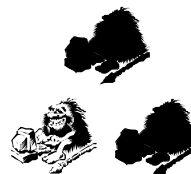
1. What fraction of each group is shaded?



A.

B.

C.



D.

E.

F.

2. From your answers to question 1 above, match the equivalent fractions.

..... = / = / =

D: Matching equivalent fractions

Match the fractions listed with an equivalent fraction in the box below.

- $\frac{1}{2}$
- $\frac{1}{3}$
- $\frac{1}{4}$
- $\frac{1}{5}$
- $\frac{2}{3}$
- $\frac{3}{4}$
- $\frac{2}{5}$
- $\frac{4}{7}$
- $\frac{5}{9}$

$\frac{12}{18}$

$\frac{12}{30}$

$\frac{7}{14}$

$\frac{18}{24}$

$\frac{9}{27}$

$\frac{12}{21}$

$\frac{20}{36}$

$\frac{6}{24}$

$\frac{5}{25}$

C: Creating equivalent fractions

To create equivalent fractions, multiply the top and bottom numbers of the fraction by the same number.

Example: $\frac{1}{4} \times \frac{5}{5} = \frac{1 \times 5}{4 \times 5} = \frac{5}{20}$.



Complete each calculation to create equivalent fractions.

- $\frac{1}{4} \times \frac{3}{3} =$
- $\frac{1}{4} \times \frac{6}{6} =$
- $\frac{3}{5} \times \frac{2}{2} =$
- $\frac{3}{7} \times \frac{4}{4} =$
- $\frac{5}{6} \times \frac{3}{3} =$
- $\frac{5}{8} \times \frac{5}{5} =$
- $\frac{2}{9} \times \frac{6}{6} =$
- $\frac{7}{10} \times \frac{2}{2} =$
- $\frac{7}{9} \times \frac{5}{5} =$
- $\frac{5}{12} \times \frac{3}{3} =$

Complete each equivalent fraction as you replace the \blacklozenge with a number.



- $\frac{1}{4} = \frac{\blacklozenge}{8}$ $\blacklozenge =$
- $\frac{2}{3} = \frac{\blacklozenge}{6}$ $\blacklozenge =$
- $\frac{3}{4} = \frac{\blacklozenge}{12}$ $\blacklozenge =$
- $\frac{2}{5} = \frac{\blacklozenge}{20}$ $\blacklozenge =$
- $\frac{5}{7} = \frac{\blacklozenge}{21}$ $\blacklozenge =$
- $\frac{3}{10} = \frac{\blacklozenge}{50}$ $\blacklozenge =$
- $\frac{35}{60} = \frac{\blacklozenge}{12}$ $\blacklozenge =$
- $\frac{12}{48} = \frac{\blacklozenge}{12}$ $\blacklozenge =$

Write 5 equivalent fractions of your own equal to ...

19. $\frac{3}{5} =$ _____ = _____ = _____ = _____ = _____



Comments:

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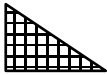


Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $18.9 + 37.8 =$
- $1250 - 953 =$
- $905 \times 11 =$
- $630 \div 90 =$
- Name this shape

.....
- $\$7.30 \times 9 =$
- Write 25 minutes to 8 as digital time

:
- Find $\frac{1}{2}$ of $\$7.30$
.....
- How many milligrams in 4.25g?
- What would 7 books at $\$4.95$ each cost?
.....

B: Expressing a fraction as a decimalFractions can be converted into a decimal by dividing the **numerator** by the **denominator**.*Example:* Write $\frac{3}{4}$ as a decimal.Answer: $4 \overline{)3.00}$

$$\begin{array}{r} 0.75 \\ 4 \overline{)3.00} \end{array}$$

Convert these fractions to decimals. Show your working.

- | | |
|---------------------------|---------------------------|
| 1. $\frac{1}{2} =$ _____ | 2. $\frac{1}{4} =$ _____ |
| 3. $\frac{1}{5} =$ _____ | 4. $\frac{3}{4} =$ _____ |
| 5. $\frac{3}{8} =$ _____ | 6. $\frac{3}{10} =$ _____ |
| 7. $\frac{5}{8} =$ _____ | 8. $\frac{5}{6} =$ _____ |
| 9. $\frac{7}{10} =$ _____ | 10. $\frac{2}{3} =$ _____ |

C: Expressing a decimal as a fraction

Decimals can be expressed as fractions with denominators of 10, 100, 1000, 10000, etc.

Convert these decimals to fractions.

- | | | |
|----------------|-----------------|-----------------|
| 1. 0.8 | 2. 0.08 | 3. 0.008 |
| 4. 0.16 | 5. 0.5 | 6. 0.302 |
| 7. 0.295 | 8. 0.0175 | 9. 0.95 |
| 10. 0.6 | 11. 0.715 | 12. 0.006 |
| 13. 0.72 | 14. 0.06 | 15. 0.635 |

D: Expressing a decimal as a percentageDecimal $\times 100 =$ percentage.

Convert these decimals to percentages.



- | | |
|----------------|----------------|
| 1. 0.8 | 2. 0.64 |
| 3. 0.16 | 4. 0.06 |
| 5. 0.59 | 6. 0.95 |
| 7. 0.6 | 8. 0.45 |
| 9. 0.36 | 10. 0.02 |
| 11. 0.72 | 12. 1.25 |
| 13. 2.72 | 14. 4.32 |

E: Expressing a percentage as a decimalPercentage $\div 100 =$ decimal.

Convert these percentages to decimals.



- | | |
|----------------|----------------|
| 1. 45% | 2. 8% |
| 3. 63% | 4. 14% |
| 5. 9% | 6. 21% |
| 7. 47% | 8. 15% |
| 9. 23% | 10. 7.3% |
| 11. 5% | 12. 260% |
| 13. 130% | 14. 365% |



Comments:

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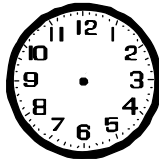
Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $2637 + 412 =$
- $986 - 249 =$
- $453 \times 40 =$
- $975 \div 5 =$
- $\$20.60 + \$1.40 + \$11.95 =$
- $\$5.94 \times 6 =$
- Draw five to 4 on this clock face
- Find 25% of \$34.00
- How many kilolitres in 7250L?
- What would 11 books at \$3.50 each cost?



B: Converting between fractions, decimals and percentages

Complete this table using the information in the box.

| Fraction | Decimal | Percentage |
|---------------|---------|------------|
| | 0.25 | |
| | | 33.3% |
| $\frac{2}{5}$ | | |
| | 0.5 | |
| $\frac{2}{3}$ | | |
| | | 75% |

| | | |
|---------------|---------------|---------------|
| 0.4 | 50% | 0.6 |
| 0.3 | $\frac{1}{3}$ | 0.75 |
| 25% | 40% | $\frac{3}{4}$ |
| $\frac{1}{4}$ | 66.6% | $\frac{1}{2}$ |

C: Expressing a quantity as a fraction of a whole

1. Express the shaded diagrams as a fraction of each group.

A B C A =

B =

C =

Read each statement and write the information as a fraction.

- Joanne scored 19 out of 30 in a maths test.
- Of 60 pets, 47 were cats.
- It was sunny 4 days last week.
- Sally slept for 10 hours yesterday.
- What fraction of your class are boys?

E: Word problems

Jimmy has a 200mL container of juice.



- If he has 150mL left, what **percentage** of the juice has he drunk?

Jill is going to run 10 times around a local park.



- What **fraction** of her run does she have left to do, if she has only run 3 laps?

A petrol tank holds 50L, but only has 20L left in it.

- What **percentage** of a full tank of petrol has been used so far?

In Kaye's class of 30 pupils, 25 pupils went to the movies.

- What **fraction** of Kaye's class did not go?

D: Expressing a quantity as a % of a whole

1. Express the shaded diagrams as a **percentage** of each group.

A B C A =

B =

C =

Read each statement and write the information as a **percentage**.

- Joanne scored 42 out of 50 in a maths test.
- Of 20 pets, 11 were cats.
- It was sunny for 5 days out of 20.
- Sally lost 7 of her 10 new pens.
- 8 out of 25 pupils have a cold.



Comments:

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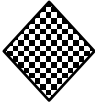


Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $45.9 + 241 =$
- $970 - 438 =$
- $928 \times 9 =$
- $840 \div 70 =$
- Name this shape 
- $\$2.95 \times 8 =$
- Write 10 minutes past 10 as digital time

| | |
|--|--|
| | |
|--|--|
- Find 50% of \$9.50
.....
- How many centimetres in 5.68m?
- What would 9 books at \$9.65 each cost?
.....

B: Rounding and estimation

When an accurate answer is not required or when doing a quick calculation, rounding a number can be a useful skill to use.

Round these numbers to the nearest 10.

1. 19 2. 95 3. 83

Round these numbers to the nearest 100.

4. 86 5. 249 6. 584

Round these numbers to the nearest 1000.

7. 1240 8. 5369 9. 4641

Round these numbers to the nearest 10, 100 or 1000. before working out an **estimated answer**.

- | | | |
|----------------------|------------------------|---------|
| 10. $423 + 657$ | = + | = |
| 11. $1624 - 967$ | = - | = |
| 12. 3897×19 | = \times | = |
| 13. $2512 \div 49$ | = \div | = |
| 14. $7812 + 9183$ | = + | = |
| 15. 609×95 | = \times | = |
| 16. $3205 - 1865$ | = - | = |

C: Word problems

A bus driver records the distances he travelled each day for a week as shown below.

95km, 41km, 56km, 73km,
142km, 87km, 62km

Work out an **estimated total distance** he travelled by rounding to the nearest 10km, then the **actual distance**.

Estimated distance



.....

 +

Actual distance

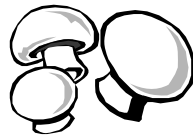
.....

 +



D: Estimations involving money

Work out an **estimated cost** using rounding, then the **actual cost** of the following shopping lists.



mushrooms
\$7.90 / kg



beans
\$2.90 / kg



carrots
\$1.90 / kg



broccoli
\$5.90 / kg

List A

- 2kgs of carrots
3kgs of beans
1kg of broccoli
 $\frac{1}{2}$ kg of mushrooms

Estimated total

- | | |
|--------------------------------------|---------------------------------------|
| 2 \times = | 2 \times \$1.90 = |
| 3 \times = | 3 \times \$2.90 = |
| 1 \times = | 1 \times \$5.90 = |
| $\frac{1}{2}$ \times = | $\frac{1}{2}$ \times \$7.90 = |

\$

\$

List B

- 4kgs of carrots
2kgs of beans
2kg of broccoli
3kg of mushrooms

Estimated total

- | | |
|--------------------------|---------------------------|
| 4 \times = | 4 \times \$1.90 = |
| 2 \times = | 2 \times \$2.90 = |
| 2 \times = | 2 \times \$5.90 = |
| 3 \times = | 3 \times \$7.90 = |

\$

\$

Comments:

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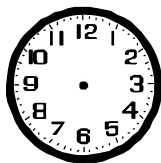
Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $1903 + 784 =$
- $960 - 889 =$
- $942 \times 20 =$
- $690 \div 5 =$
- $\$2.10 + \$31.75 + \$11.45 =$
- $\$1.45 \times 11 =$
- Draw
twenty
past 11
on this
clock face
- Find 25% of \$50.00
.....
- How many litres in
8.25kL?
- What would 10 books at
\$2.10 each cost?
.....



B: Multiplying and dividing by powers of 10

Calculate the following.

- $5.3 \times 100 =$
- $5.3 \div 100 =$
- $2.9 \times 10000 =$
- $25.4 \times 10000 =$
- $762 \div 100 =$
- $0.56 \div 10 =$
- $36.3 \times 1000 =$
- $4531 \div 100 =$
- $4.3 \div 1000 =$
- $0.35 \times 1000 =$
- If Jan buys 1000 envelopes at 25 cents each, how much will it cost? Give your answer in dollars.
- If Jan paid \$80.00 for a box of 100 stamps, how much does one stamp cost?
.....
- If a brick fence is to be built using 100000 bricks, how much will the bricks cost if each brick costs 40 cents?



C: Multiplying and dividing decimals

Calculate the following, showing your working.

- | | | | |
|---|---|--|--|
| 1. $0.06 \times 9 =$ | 2. $1.8 \div 3 =$ | | |
| 3. $0.84 \div 4 =$ | 4. $0.06 \times 0.03 =$ | | |
| 5. $0.025 \times 0.5 =$ | 6. $5.49 \div 0.09 =$ | | |
| 7. $0.32 \div 0.8 =$ | 8. $36.6 \times 0.03 =$ | | |
| 9. $2.34 \times 0.02 =$ | 10. $0.49 \div 0.7 =$ | | |
| 11. $\begin{array}{r} 153.9 \\ \times 70 \\ \hline \end{array}$ | 12. $\begin{array}{r} 2.86 \\ \times 0.9 \\ \hline \end{array}$ | 13. $\begin{array}{r} 34.76 \\ \times 0.08 \\ \hline \end{array}$ | 14. $\begin{array}{r} 43.5 \\ \times 1.1 \\ \hline \end{array}$ |
| 15. $\begin{array}{r} 0.5 \overline{)26.5} \\ \hline \end{array}$ | 16. $\begin{array}{r} 0.02 \overline{)2.842} \\ \hline \end{array}$ | 17. $\begin{array}{r} 0.3 \overline{)0.273} \\ \hline \end{array}$ | 18. $\begin{array}{r} 0.004 \overline{)8.168} \\ \hline \end{array}$ |
| 19. $\begin{array}{r} 2.36 \\ \times 3.7 \\ \hline \end{array}$ | 20. $\begin{array}{r} 43.96 \\ \times 0.48 \\ \hline \end{array}$ | 21. $\begin{array}{r} 0.462 \\ \times 96 \\ \hline \end{array}$ | 22. $\begin{array}{r} 63.4 \\ \times 0.065 \\ \hline \end{array}$ |

D: Word problems

A 73.5km motor cycle race is raced around 5 laps of a street course.

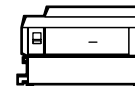
- How far is each lap?
.....



The second race of the day is a 10 lap race on the same course.

- Use your answer in Q1 above to calculate the distance of the second race.
.....

Photocopying costs 7 cents per copy.



- Convert 7 cents to dollars
- Calculate the cost, of photocopying
100 copies
- 1000 copies
- 450 copies
- 725 copies



Comments:

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Parent / Caregiver

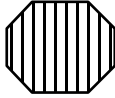


Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $89 + 17.6 =$
- $790 - 573 =$
- $608 \times 12 =$
- $540 \div 60 =$
- Name this shape 
- $\$9.50 \times 8 =$
- Write 5 minutes to 7 as digital time

| |
|--|
| |
| |
| |
| |
- Find $\frac{1}{2}$ of $\$12.70$
.....
- How many metres in 8625mm?
- What would 6 books at $\$11.35$ each cost?
.....

B: Finding a fraction of a quantity

Example: Find $\frac{3}{4}$ of 60.

$60 \div 4 = 15, 15 \times 3 = 45.$ Answer: 45

Calculate the following fractions of these whole numbers.

- | | |
|-------------------------------|--------------------------------|
| 1. $\frac{1}{4}$ of 20 | 2. $\frac{1}{3}$ of 24 |
| 3. $\frac{1}{10}$ of 80 | 4. $\frac{1}{8}$ of 40 |
| 5. $\frac{5}{7}$ of 28 | 6. $\frac{2}{9}$ of 54 |
| 7. $\frac{5}{6}$ of 48 | 8. $\frac{3}{10}$ of 60 |
| 9. $\frac{5}{7}$ of 49 | 10. $\frac{2}{11}$ of 55 |

C: Finding a percentage of a quantity

Example: Find 40% of 60

$40\% = 0.4, 0.4 \times 60 = 24$

or $40\% = \frac{2}{5}, 60 \div 5 = 12, 12 \times 2 = 24$ Answer: 24

Calculate the following fractions of these whole numbers.

- | | |
|---------------------|---------------------|
| 1. 10% of 40 | 2. 10% of 95 |
| 3. 40% of 70 | 4. 60% of 80 |
| 5. 80% of 120 | 6. 30% of 54 |
| 7. 25% of 48 | 8. 25% of 76 |
| 9. 75% of 60 | 10. 90% of 48 |

D: Word problems involving fractions and percentages

A school basketball team has won 60% of the 20 games it has played this season.

- Calculate how many games they won.
- What percentage of the games did they not win?

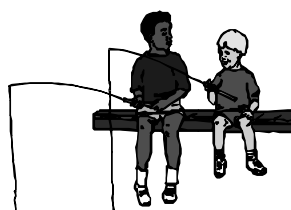
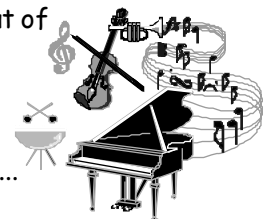


In Room 8 there are 30 pupils, $\frac{1}{5}$ of the pupils are aged 11, $\frac{3}{5}$ of the pupils are 12 and the rest of the pupils are aged 13.

- Calculate how many pupils are 12 years old.
- Calculate how many pupils are 11 years old.
- What fraction of Room 8 pupils are aged 13?
- Calculate how many pupils are 13 years old.

In a South Island town, 1200 people went to a concert in a park. 20% were from out of town, 70% were local people and the rest were from the North Island.

- Calculate the number of local people at the concert.
- Calculate the number of out of town people who went.
- What percentage of the people were from the North Island?
- Calculate the number of North Islanders at the concert.



During one day in the holidays, James spent $\frac{1}{6}$ of the time playing computer games, $\frac{1}{2}$ of the time fishing and the rest of the time sleeping.

- Calculate how many hours James was fishing.
- Calculate how many hours he played on the computer.
- Calculate how many hours James was asleep.
- What fraction of the day did James sleep?



Comments:

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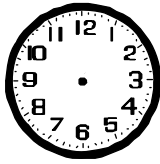
Name: _____

Class: _____

Complete by: _____

A: 10 'Quick Questions'

- $1623 + 824 =$
- $750 - 629 =$
- $549 \times 50 =$
- $740 \div 5 =$
- $\$19.40 + \$23.75 + \$1.15 =$
.....
- $\$3.15 \times 8 =$
- Draw
twenty-five
to 1
on this
clock face
- Find $\frac{1}{4}$ of $\$62.00$
.....
- How many kilometres in
4950m?
- What would 8 books at
 $\$9.20$ each cost?
.....



B: Adding, subtracting and multiplying

Show clearly your working, when calculating these questions.

- | | | | |
|---|---|---|---|
| 1. $\begin{array}{r} 236 \\ 84 \\ \hline 3562 \\ + 9 \\ \hline \end{array}$ | 2. $\begin{array}{r} 906 \\ 1039 \\ 7 \\ + 463 \\ \hline \end{array}$ | 3. $\begin{array}{r} 6957 \\ - 4397 \\ \hline \end{array}$ | 4. $\begin{array}{r} 10000 \\ - 4236 \\ \hline \end{array}$ |
| 5. $\begin{array}{r} 3465 \\ \times 87 \\ \hline \end{array}$ | 6. $\begin{array}{r} 43106 \\ \times 54 \\ \hline \end{array}$ | 7. $\begin{array}{r} 19405 \\ \times 253 \\ \hline \end{array}$ | |

C: Order of operations

Calculate the following, remembering to use the **BODMAS** or **BEDMAS** order of operation rules, and show your working.

- | | |
|---|-------------------------------|
| 1. $7 \times 8 + 10 = 56 + 10$ = | 2. $19 + 20 \div 5 =$ |
| 3. $55 \div 5 - 8 =$ | 4. $24 - 3 \times 6 =$ |
| 5. $27 - 4 \times 5 =$ | 6. $6 \times 8 + 9 =$ |
| 7. $63 \div 7 + 11 =$ | 8. $8 \times 9 - 47 =$ |
| 9. $6 \times 9 - 41 =$ | 10. $63 \div 9 - 7 =$ |
| 11. $16 + 48 \div 12 =$ | 12. $23 + 49 \div 7 =$ |
| 13. $56 \div 7 - 6 =$ | 14. $4 \times 9 + 10 =$ |

D: Order of operations involving brackets

Remember that $5(3 + 6)$... means $5 \times (3 + 6)$
Calculate the following and show your working.

- $2(5 \times 2 + 1)$
=
=
- $5(28 \div 4 - 3)$
=
=
- $13 + 2(15 - 9)$
=
=
- $37 - 3(5 + 2)$
=
=
- $9 + 2(9 - 12 \div 6)$
=
=
- $3(5 \times 2 - 1) + 20$
=
=

E: Missing signs

Make each statement true by placing +, -, \times or \div signs in the boxes between the numbers.

- $4 \square 3 \square 5 = 7$
- $20 \square 4 \square 6 = 11$
- $7 \square 18 \square 3 = 13$
- $20 \square 2 \square 7 = 6$
- $3 \square 8 \square 4 = 6$

F: Word problems

Mary buys 3 rolls of film at $\$6.50$ each and 4 batteries at $\$1.10$ each.



- How much did she spend?
.....
- David buys 20 pencils at 50 cents each, a diary for $\$6.25$ and 3 exercise books for 90 cents each.
How much did he spend?
.....



Comments:

Please sign:
Parent / Caregiver

Homework / Assessment Worksheet

Answers

Worksheet 1

A:

1. 36.3 2. 157 3. 4950 4. 4 5. pentagon 6. \$44.10 7. 08:35 8. \$7.15 9. 8.7km
10. \$39.75

B:

1. prime 2. multiples 3. factor 4. prime factor

C:

- 2, 5, 11, 17, 19, 23, 29, 31, 37, 53, 59

D:

1. 16, 24, 32, 40, 48, 56 2. 12, 18, 24, 30, 36, 42 3. 22, 33, 44, 55, 66, 77
4. 14, 21, 28, 35, 42, 49 5. 30, 45, 60, 75, 90, 105 6. 40, 60, 80, 100, 120, 140
7. 50, 75, 100, 125, 150, 175 8. 12, 24, 36, 48 9. 72, 84, 96

E:

1. 1, 2, 3, 4, 6, 12 2. 1, 3, 5, 15 3. 1, 19 4. 1, 2, 3, 4, 6, 8, 12, 24 5. 1, 2, 3, 5, 6, 10, 15, 30
6. $3 \times 5 = 15$ 7. $2 \times 13 = 26$ 8. $3 \times 11 = 33$

F:

1. 37 2. 54 3. 15 4. 65

Worksheet 2

A:

1. 2917 2. 211 3. 18720 4. 170 5. \$40.15 6. \$29.75 7.
8. \$6.75 9. 6900m 10. \$32.55



B:

1. 8m 2. 4m, 7m, 10m 3. -2m, -5m, -6m, -7m 4. -4m

C:

1. -2°C 2. -4°C , 5°C , -3°C , -8°C , -3°C

D:

1. 2 2. 2 3. -3 4. 4 5. -4 6. 1 7. -3 8. 3 9. -2 10. 5 11. 4 12. -3 13. -9
14. -11

E:

1. $-\$150$ 2. $\$25$ 3. $-\$80$

F:

$$4 + ^{-}5 + ^{-}1 + 6 + ^{-}3 + ^{-}3 = ^{-}2$$

Worksheet 3

A:

1. 52.8 2. 359 3. 2832 4. 7 5. parallelogram 6. \$50.40 7. 05:10 8. \$4.79 9. 7.5kg
10. \$69.20

B:

1. $5 \times 5 = 25$ 2. 16 3. 81 4. 64 5. 144 6. 121 7. 36 8. 169 9. 49 10. 25 11. 100
12. 289 13. 225 14. 625 15. 400 16. 1600 17. 2500 18. 8 19. 4 20. 5 21. 12
22. 10 23. 9 24. 15 25. 20 26. 30 27. 14

C:

1. $2 \times 2 \times 2 = 8$ 2. 27 3. 64 4. 125 5. 216 6. 343 7. 512 8. 1000 9. 8000

D:

1. 3^4 2. 7^5 3. 9^6 4. 16 5. 81 6. 32 7. 625 8. 256 9. 10000

E:

- 49
- 81
- 27
- 125

Worksheet 4

A:

- 2680
- 298
- 50320
- 168
- \$33.12
- \$34.00
- \$9.50
- 570mm
- \$83.25



B:

- $A = \frac{1}{2}, B = \frac{4}{10}, C = \frac{4}{6}, D = \frac{4}{8}, E = \frac{2}{3}, F = \frac{2}{5}$
- $\frac{1}{2} = \frac{4}{8}, \frac{2}{3} = \frac{4}{6}, \frac{2}{5} = \frac{4}{10}$

C:

- $\frac{3}{12}$
- $\frac{6}{24}$
- $\frac{6}{10}$
- $\frac{12}{28}$
- $\frac{15}{18}$
- $\frac{25}{40}$
- $\frac{12}{54}$
- $\frac{14}{20}$
- $\frac{35}{45}$
- $\frac{15}{36}$
- 2
- 4
- 9
- 8
- 15
- 15
- 7
- 3
- possible answer: $\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20} = \frac{15}{25} = \frac{18}{30}$ etc.

D:

- $\frac{7}{14}$
- $\frac{9}{27}$
- $\frac{6}{24}$
- $\frac{5}{25}$
- $\frac{12}{18}$
- $\frac{18}{24}$
- $\frac{12}{30}$
- $\frac{12}{21}$
- $\frac{20}{36}$

Worksheet 5

A:

- 56.7
- 297
- 9955
- 7
- right angled triangle
- \$65.70
- 07:35
- \$3.65
- 4250mg
- \$34.65

B:

- 0.5
- 0.25
- 0.2
- 0.75
- 0.375
- 0.3
- 0.625
- 0.83'
- 0.7
- 0.6'

C:

- $\frac{8}{10}$
- $\frac{8}{100}$
- $\frac{8}{1000}$
- $\frac{16}{100}$
- $\frac{5}{10}$
- $\frac{302}{1000}$
- $\frac{295}{1000}$
- $\frac{175}{10000}$
- $\frac{95}{100}$
- $\frac{6}{10}$
- $\frac{715}{1000}$
- $\frac{6}{1000}$
- $\frac{72}{100}$
- $\frac{6}{100}$
- $\frac{635}{1000}$

D:

- 80%
- 64%
- 16%
- 6%
- 59%
- 95%
- 60%
- 45%
- 36%
- 2%
- 72%
- 125%
- 272%
- 432%

E:

- 0.45
- 0.08
- 0.63
- 0.14
- 0.09
- 0.21
- 0.47
- 0.15
- 0.23
- 0.073
- 0.05
- 2.6
- 1.3
- 3.65

Worksheet 6

A:

- 3049
- 737
- 18120
- 195
- \$33.95
- \$35.64
- \$8.50
- 7.25kL
- \$38.50



B:

| Fraction | Decimal | Percentage |
|---------------|---------|------------|
| $\frac{1}{4}$ | 0.25 | 25% |
| $\frac{1}{3}$ | 0.3' | 33.3% |
| $\frac{2}{5}$ | 0.4 | 40% |
| $\frac{1}{2}$ | 0.5 | 50% |
| $\frac{2}{3}$ | 0.6' | 66.6% |
| $\frac{3}{4}$ | 0.75 | 75% |

C:

- $A = \frac{2}{5}, B = \frac{2}{4} = \frac{1}{2}, C = \frac{4}{5}$
- $\frac{19}{30}$
- $\frac{47}{60}$
- $\frac{4}{7}$
- $\frac{10}{24}$
-

D:

- A = 60%, B = 75%, C = 66.6%
- 84%
- 55%
- 25%
- 70%
- 32%

E:

- 25%
- $\frac{7}{10}$
- 60%
- $\frac{5}{30} = \frac{1}{6}$

Worksheet 7

A:

1. 286.9 2. 532 3. 8352 4. 12 5. diamond or rhombus 6. \$23.60 7. 10:10 8. \$4.75
9. 568cm 10. \$86.85

B:

1. 20 2. 100 3. 80 4. 100 5. 200 6. 600 7. 1000 8. 5000 9. 5000
10. $420 + 660 = 1080$ 11. $1600 - 1000 = 500$ 12. $4000 \times 20 = 80000$ 13. $2500 \div 50 = 50$
14. $7800 + 9200 = 17000$ 15. $600 \times 100 = 60000$ 16. $3200 - 1900 = 1300$

C:

Estimated distance Actual distance = 556km

$$\begin{array}{r}
 100 \\
 40 \\
 60 \\
 70 \\
 140 \\
 90 \\
 + 60 \\
 \hline
 560\text{km}
 \end{array}$$

D:

Shopping List A

| Estimated total | Actual total |
|--------------------------------|--------------------------------------|
| $2 \times \$2 = \4 | $2 \times \$1.90 = \3.80 |
| $3 \times \$3 = \9 | $3 \times \$2.90 = \8.70 |
| $1 \times \$6 = \6 | $1 \times \$5.90 = \5.90 |
| $\frac{1}{2} \times \$8 = \4 | $\frac{1}{2} \times \$7.90 = \3.95 |
| \$23 | \$22.35 |

Shopping List B

| Estimated total | Actual total |
|-----------------------|-----------------------------|
| $4 \times \$2 = \8 | $4 \times \$1.90 = \7.60 |
| $2 \times \$3 = \6 | $2 \times \$2.90 = \5.80 |
| $2 \times \$6 = \12 | $2 \times \$5.90 = \11.80 |
| $3 \times \$8 = \24 | $3 \times \$7.90 = \23.70 |
| \$50 | \$48.90 |

Worksheet 8

A:

1. 2687 2. 71 3. 18840 4. 138 5. \$45.30 6. \$15.95 7.



8. \$12.50 9. 8250L 10. \$21.00

B:

1. 530 2. 0.053 3. 29000 4. 254000 5. 7.62 6. 0.056 7. 36300 8. 45.31
9. 0.0043 10. 350 11. \$250 12. \$0.80 or 80 cents 13. \$40000

C:

1. 0.54 2. 0.6 3. 0.21 4. 0.0018 5. 0.0125 6. 61 7. 0.4 8. 1.098 9. 0.0468
10. 0.7 11. 10773 12. 2.574 13. 2.7808 14. 47.85 15. 53 16. 142.1 17. 0.91
18. 2042

| | | | | | | | |
|-----|--------------|-----|---------------|-----|-------------|-----|----------------|
| 19. | 2.36 | 20. | 43.96 | 21. | 0.462 | 22. | 63.4 |
| | $\times 3.7$ | | $\times 0.41$ | | $\times 96$ | | $\times 0.065$ |
| | <hr/> | | <hr/> | | <hr/> | | <hr/> |
| | 1652 | | 35168 | | 2772 | | 3170 |
| | <hr/> | | <hr/> | | <hr/> | | <hr/> |
| | 7080 | | 175840 | | 41580 | | 38040 |
| | <hr/> | | <hr/> | | <hr/> | | <hr/> |
| | 8.732 | | 21.1008 | | 44.352 | | 4.1210 |
| | <hr/> | | <hr/> | | <hr/> | | <hr/> |

D:

1. 14.7km 2. 147km 3. \$0.07 4. \$7.00, \$70.00, \$31.50, \$50.75

Worksheet 9

A:

1. 106.6 2. 217 3. 7296 4. 9 5. octagon 6. \$76.00 7. 06:55 8. \$6.35 9. 8.625m
10. \$68.10

B:

1. 5 2. 8 3. 8 4. 5 5. 20 6. 12 7. 40 8. 18 9. 35 10. 10

C:

1. 4 2. 9.5 3. 28 4. 48 5. 96 6. 16.2 7. 12 8. 19 9. 45 10. 43.2

D:

1. 12 games 2. 40% 3. 18 pupils 4. 6 pupils 5. $\frac{1}{5}$ 6. 6 pupils 7. 840 people
8. 240 people 9. 10% 10. 120 people 11. 12 hours 12. 4 hours 13. 8 hours 14. $\frac{8}{24} = \frac{1}{3}$

Worksheet 10

A:

1. 2447 2. 121 3. 27450 4. 148 5. \$44.30 6. \$25.20 7.
8. \$15.50 9. 4.95km 10. \$73.60



B:

| | | | | | | |
|---------|---------|---------|---------|---|---|--|
| 1. 3891 | 2. 2415 | 3. 2560 | 4. 5764 | 5. $\begin{array}{r} 3465 \\ \times 87 \\ \hline 24255 \\ \hline 277200 \\ \hline 301455 \end{array}$ | 6. $\begin{array}{r} 43106 \\ \times 54 \\ \hline 172424 \\ \hline 2155300 \\ \hline 2327724 \end{array}$ | 7. $\begin{array}{r} 19405 \\ \times 253 \\ \hline 58215 \\ \hline 970250 \\ \hline 3881000 \\ \hline 4909465 \end{array}$ |
|---------|---------|---------|---------|---|---|--|

C:

1. $56 + 10 = 66$ 2. $19 + 4 = 23$ 3. $11 - 8 = 3$ 4. $24 - 18 = 6$ 5. $27 - 20 = 7$ 6. $48 + 9 = 57$
7. $9 + 11 = 20$ 8. $72 - 47 = 25$ 9. $54 - 41 = 13$ 10. $7 - 7 = 0$ 11. $16 + 4 = 20$ 12. $23 + 7 = 30$
13. $8 - 6 = 2$ 14. $36 + 10 = 46$

D:

1. $2(10 + 1) = 2 \times 11 = 22$ 2. $5(7 - 3) = 5 \times 4 = 20$ 3. $13 + 2 \times 6 = 13 + 12 = 25$
4. $37 - 3 \times 7 = 37 - 21 = 16$ 5. $9 + 2(9 - 2) = 9 + 2 \times 7 = 9 + 14 = 23$
6. $3(10 - 1) + 20 = 3 \times 9 + 20 = 27 + 20 = 47$

E:

1. $4 \times 3 - 5 = 7$ 2. $20 \div 4 + 6 = 11$ 3. $7 + 18 \div 3 = 13$ 4. $20 - 2 \times 7 = 6$ 5. $3 \times 8 \div 4 = 6$

F:

1. $\$19.50 + \$4.40 = \$23.90$ 2. $\$10 + \$6.25 + \$2.70 = \18.95

