EXERCISE 2B

1 Write in numeral form:

   a forty-seven

   b six hundred and forty-eight

   c seven hundred and one

   d three thousand, four hundred and forty-eight

   e six hundred and twenty five thousand, nine hundred and ninety

   f three million, six hundred thousand, nine hundred and seventy-three.

2 When writing out a *cheque* to pay a debt, the amount must be written in numbers and words. Write the following amounts in words:

   a $91   **b** $362   **c** $4056

   d $9807   **e** $43 670   **f** $507 800

3 What value is represented by the digit 7 in the following?

   a 47   **b** 67   **c** 372   **d** 702

   e 4709   **f** 17 000   **g** 3067   **h** 370 000

   i 175 236   **j** 5 700 000   **k** 67 000 000   **l** 146 070

4 Write the following numbers:

   a one less than nine   **b** two greater than ten   **c** one less than 200

   d 2 more than 3000   **e** the largest two digit number.

5 Put the following numbers in order beginning with the smallest:

   a Kylie 57 kg, Amanda 75 kg, Sarah 49 kg, Lindy 60 kg

   b Josh 183 cm, Gavin 148 cm, Tony 138 cm, Matt 184 cm

   c $1100, $1004, one thousand and forty dollars

   d Barina 708 kg, Laser 880 kg, Excel 808 kg, Corolla 890 kg

   e forty dollars, forty-four dollars, fourteen dollars, fifty-four dollars, forty-five dollars.

Example 2

   a Express $50\,000 + 6000 + 70 + 4$ in simplest form.

   b Write 6807 in expanded form.

   a $50\,000 + 6000 + 70 + 4 = 56\,074$

   b $6807 = 6000 + 800 + 7$

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6 Express the following in simplest form:

   a $90 + 7$ **b** $400 + 30 + 6$

   c $8000 + 4$ **d** $5000 + 600 + 8$

   e $70\,000 + 60 + 5$ **f** $4\,000\,000 + 900 + 8$

7 Write in expanded form:

   a 730   **b** 4871   **c** 68 904   **d** 760 391

ROUNDING RULES

The **rules** for **rounding off** are:

- If the digit **after** the one being rounded off is less than 5 (i.e., 0, 1, 2, 3 or 4) we **round down**.

- If the digit **after** the one being rounded off is 5 or more (i.e., 5, 6, 7, 8 or 9) we **round up**.

Example 3

Round off:

a	769 to the nearest 10	**b**	6705 to the nearest 100
c	3143 to one figure	**d**	15 579 to two figures

a	$769 \doteqdot 770$	{to nearest 10}	**b**	$6705 \doteqdot 6700$	{to nearest 100}
c	$3143 \doteqdot 3000$	{to one figure}	**d**	$15\,579 \doteqdot 16\,000$	{to two figures}

EXERCISE 2C.1

1 Round off to the nearest 10:

a	43	**b**	65	**c**	98	**d**	147
e	199	**f**	451	**g**	797	**h**	9995

2 Round off to the nearest 100:

a	87	**b**	369	**c**	442	**d**	650
e	991	**f**	1426	**g**	11 765	**h**	34 037

3 Round off to the nearest 1000:

a	784	**b**	5500	**c**	7435	**d**	9987
e	12 324	**f**	23 497	**g**	53 469	**h**	670 934

4 Round off to one figure:

a	69	**b**	197	**c**	293	**d**	347
e	963	**f**	2555	**g**	6734	**h**	39 500

5 Round off to two figures:

a	891	**b**	166	**c**	750	**d**	238
e	561	**f**	5647	**g**	9750	**h**	23 501

6 Round off to the accuracy given:

- **a** $35 246   (to the nearest $1000)
- **b** a distance of 3651 km   (to the nearest 100 km)
- **c** a weekly salary of $375   (to one figure)
- **d** last year a company's profit was $237 629   (to the nearest $10 000)
- **e** the population of a town is 16 723   (to the nearest thousand)
- **f** the number of people at a rugby match is 35 381   (to two figures)

ESTIMATION

To avoid errors, it is important to make **estimates** of the answers to problems. An estimate is not a guess. It is a quick and easy approximation of the correct answer.

By making an estimate we can tell if our answer is reasonable, particularly when we are using our calculator and may have entered the numbers incorrectly.

When estimating, we usually **round to the first digit** and put zeros in the other places.

Example 4

Find the approximate value of 7235×591.

Round off to the first digit, put zeros in the other places.

$$7235 \times 591 \doteqdot 7000 \times 600$$
$$\doteqdot 4\,200\,000$$

The estimate tells us the correct answer should have 7 places in it. We expect the answer to be about 4 million.

EXERCISE 2C.2

1 Estimate the following using 1 figure working:

    a 24×36 **b** 69×13 **c** 58×91

    d 389×63 **e** 4619×22 **f** 4062×638

    g 389×2178 **h** $588 \times 11\,642$ **i** $29 \times 675\,328$

Example 5	
Find the approximate value of $3946 \div 79$.	$3946 \div 79$ $\doteqdot 4000 \div 80$ {using 1 figure working} $\doteqdot 400 \div 8$ {dividing each number by 10} $\doteqdot 50$

2 Estimate the following using 1 figure working:

    a $56 \div 19$ **b** $103 \div 52$ **c** $89 \div 27$

    d $641 \div 59$ **e** $2038 \div 49$ **f** $5899 \div 30$

    g $2780 \div 41$ **h** $85\,980 \div 299$ **i** $36\,890 \div 786$

3 In the following questions round given data to one figure to find the approximate value asked for.

    a   On a paper round Tracy delivers 405 papers every week. She does this every week for the year. Find an approximation for the number of papers delivered in the year.

    b   In an orchard there are 103 orange trees in each row. There are 58 rows. Find the approximate number of orange trees in the orchard.

    c   If a trip of 642 km from Auckland to Marsterton took 11 hours, find my approximate average speed in kilometres per hour.

    d   If Joe can type at 52 words per minute, find an approximate time needed for him to type a document of 3920 words.

    e   Tim counted 42 jelly beans in the bottom layer of a jar and thinks that there are 38 layers in the jar. What is his estimate of the number of jelly beans in the jar?

    f   Sally earned $404 per week for 7 months of the year. Estimate the amount of money she earned.

    g   A music cassette case is 18 mm deep. If I stack 52 of these on top of each other approximately how high will the stack be?

PRODUCTS AND QUOTIENTS

- The word **product** is used to represent the result of a multiplication.
  For example, the product of 3 and 5 is $3 \times 5 = 15$.
- The word **quotient** is used to represent the result of a division.
  For example, the quotient of $15 \div 3$ is 5.
- When **multiplying**, changing the order can often be used to simplify the process.
- Multiplying by **one (1)** does not change the value of a number.
  For example, $17 \times 1 = 17$, $1 \times 17 = 17$.
- Multiplying by **zero (0)** produces zero.
  For example, $17 \times 0 = 0$.
- Division by zero (0) is meaningless; we say it is **undefined**.
  For example, $0 \div 4 = 0$
  but $4 \div 0$ is undefined.

Neither the Egyptians nor the Romans had a symbol to represent nothing. The symbol 0 was called zephirum in Arabic. Our word zero comes from this.

EXERCISE 2D.2

1 Find the product:

a	8×9	**b**	80×9	**c**	80×90
d	5×6	**e**	50×6	**f**	50×600
g	7×13	**h**	7×1300	**i**	$70 \times 13\,000$

2 Find the quotient:

a	$8 \div 4$	**b**	$80 \div 4$	**c**	$8000 \div 40$
d	$36 \div 9$	**e**	$360 \div 90$	**f**	$3600 \div 9$
g	$56 \div 8$	**h**	$560 \div 80$	**i**	$56\,000 \div 800$

To find the quotient of two numbers we divide them.

Example 9

Simplify: **a** $4 \times 37 \times 25$ **b** $17 \times 8 \times 125$

a $ 4 \times 37 \times 25$
$= 4 \times 25 \times 37$
$= 100 \times 37$
$= 3700$

b $ 17 \times 8 \times 125$
$= 17 \times 1000$
$= 17\,000$

Reminder:

- $4 \times 25 = 100$
- $8 \times 125 = 1000$

3 Simplify the following, taking short cuts where possible:

a	$5 \times 41 \times 2$	**b**	$25 \times 91 \times 4$	**c**	$20 \times 113 \times 5$
d	$50 \times 200 \times 19$	**e**	$57 \times 125 \times 8$	**f**	$789 \times 250 \times 40$
g	$4 \times 8 \times 125 \times 250$	**h**	$8 \times 2 \times 96 \times 125 \times 50$	**i**	$5 \times 57 \times 8 \times 125 \times 200$

4 Simplify, if possible:

a	6×0	**b**	$6 \div 0$	**c**	0×6
d	$0 \div 11$	**e**	11×0	**f**	0×11
g	0×1	**h**	0×0	**i**	$0 \div 1$
j	0×37	**k**	87×0	**l**	$87 \div 0$

Check these results on your calculator!

5 Simplify the following:

a 39×13	**b** 107×9	**c** 117×17	**d** 24×45
e 67×84	**f** 405×32	**g** $184 \div 8$	**h** $1212 \div 6$
i $432 \div 18$	**j** $98 \div 7$	**k** $507 \div 13$	**l** $1311 \div 23$

6 Find:

a the product of 17 and 32

b the quotient of 437 and 19

c the product of the first 5 natural numbers

7 Solve the following problems:

a What must I multiply $25 by to get $1375?

b What answer would I get if I start with 69 and add on 8, 31 times?

c I planted 400 rows of cabbages and each row contained 250 plants. How many cabbages were planted altogether?

d Ian swims 4500 m in a training session. If the pool is 50 m long, how many laps does he swim?

e Rima walks 13 km a day. How far does she walk in 20 days?

f I am able to save $15 a week from my earnings. If I need to save $345 for a new game, how many weeks will it take me?

8 Solve the following problems:

a A contractor bought 34 loads of soil each weighing 12 tonnes at $13 per tonne. What was the total cost?

b All rooms of a motel cost $78 per day to rent. The motel has 6 floors and 37 rooms per floor. What is the total rental received per day if the motel is fully occupied?

9 Revisit the Opening Problem. A sixteen storey hotel (floors are G, 1, 2, ..., 15) has no accommodation on the ground floor. On the even numbered floors (2, 4, 6, ...) there are 28 guest rooms and on the odd numbered floors there are 25 guest rooms. Room cleaners work for four hours each day during which time each cleaner can clean 12 guest rooms. Each cleaner is paid at a rate of $11 per hour.

a How many floors are odd numbered?

b How many guest rooms in total are on all the odd numbered floors?

c If each guest room has three chairs, how many chairs are on an even numbered floor?

d How many guest rooms are in the hotel?

e How many cleaners are required to clean all guest rooms assuming the hotel was 'full' the previous night?

f What is the total cost of hiring the cleaners to clean the guest rooms of the hotel?

Answers

EXERCISE 2B

1 **a** 47 **b** 648 **c** 701 **d** 3448 **e** 625 990
   f 3600 973
2 **a** ninety-one dollars
   b three hundred and sixty-two dollars
   c four thousand and fifty-six dollars
   d nine thousand, eight hundred and seven dollars
   e forty-three thousand six hundred and seventy dollars
   f five hundred and seven thousand, eight hundred dollars
3 **a** 7 **b** 7 **c** 70 **d** 700 **e** 700 **f** 7000
   g 7 **h** 70 000 **i** 70 000 **j** 700 000
   k 7 000 000 **l** 70
4 **a** 8 **b** 12 **c** 199 **d** 3002 **e** 99
5 **a** Sarah 49 kg, Kylie 57 kg, Lindy 60 kg,
      Amanda 75 kg
   b Tony 138 cm, Gavin 148 cm, Josh 183 cm,
      Matt 184 cm
   c $1004, one thousand and forty dollars, $1100
   d Barina 708 kg, Excel 808 kg, Laser 880 kg,
      Corolla 890 kg
   e fourteen dollars, forty dollars, forty-four dollars,
      forty-five dollars, fifty-four dollars
6 **a** 97 **b** 436 **c** 8004 **d** 5608 **e** 70 065
   f 4 000 908
7 **a** 700 + 30 **b** 4000 + 800 + 70 + 1
   c 60 000 + 8000 + 900 + 4
   d 700 000 + 60 000 + 300 + 90 + 1
8 **a** 971 **b** 754 310

EXERCISE 2C.1

1 **a** 40 **b** 70 **c** 100 **d** 150 **e** 200 **f** 450
   g 800 **h** 10 000
2 **a** 100 **b** 400 **c** 400 **d** 700 **e** 1000
   f 1400 **g** 11 800 **h** 34 000
3 **a** 1000 **b** 6000 **c** 7000 **d** 10 000 **e** 12 000
   f 23 000 **g** 53 000 **h** 671 000
4 **a** 70 **b** 200 **c** 300 **d** 300 **e** 1000 **f** 3000
   g 7000 **h** 40 000
5 **a** 890 **b** 170 **c** 750 **d** 240 **e** 560 **f** 5600
   g 9800 **h** 24 000
6 **a** $35 000 **b** 3700 km **c** $400 **d** $240 000
   e 17 000 **f** 35 000

EXERCISE 2C.2

1 **a** 800 **b** 700 **c** 5400 **d** 24 000 **e** 100 000
   f 2400 000 **g** 800 000 **h** 6000 000 **i** 21 000 000
2 **a** 3 **b** 2 **c** 3 **d** 10 **e** 40 **f** 200 **g** 75
   h 300 **i** 50
3 **a** 20 000 papers **b** 6000 trees **c** 60 kmph **d** 80 min
   e 1600 jelly beans **f** $12 000 **g** 1000 mm

EXERCISE 2D.2

1 **a** 72 **b** 720 **c** 7200 **d** 30 **e** 300
   f 30 000 **g** 91 **h** 9100 **i** 910 000

2 **a** 2 **b** 20 **c** 200 **d** 4 **e** 4 **f** 400
   g 7 **h** 7 **i** 70

3 **a** 410 **b** 9100 **c** 11 300 **d** 190 000
   e 57 000 **f** 7 890 000 **g** 1 000 000
   h 9 600 000 **i** 57 000 000

4 **a** 0 **b** undefined **c** 0 **d** 0 **e** 0 **f** 0
   g 0 **h** 0 **i** 0 **j** 0 **k** 0 **l** undefined

5 **a** 507 **b** 963 **c** 1989 **d** 1080 **e** 5628
   f 12 960 **g** 23 **h** 202 **i** 24 **j** 14
   k 39 **l** 57

6 **a** 544 **b** 23 **c** 120

7 **a** 55 **b** 317 **c** 100 000 **d** 90 **e** 260 km
   f 23 weeks

8 **a** $5304 **b** $17 316

9 **a** 8 floors **b** 200 rooms **c** 84 chairs
   d 396 chairs **e** 33 cleaners **f** $1452