EXERCISE 2D.2

1 Do these multiplications:

a $\begin{array}{r} 32 \\ \times\ 7 \\ \hline \end{array}$ **b** $\begin{array}{r} 46 \\ \times\ 5 \\ \hline \end{array}$ **c** $\begin{array}{r} 238 \\ \times\ 7 \\ \hline \end{array}$ **d** $\begin{array}{r} 25 \\ \times\ 16 \\ \hline \end{array}$

e $\begin{array}{r} 37 \\ \times\ 23 \\ \hline \end{array}$ **f** $\begin{array}{r} 97 \\ \times\ 10 \\ \hline \end{array}$ **g** $\begin{array}{r} 2008 \\ \times\ 23 \\ \hline \end{array}$ **h** $\begin{array}{r} 427 \\ \times\ 83 \\ \hline \end{array}$

2 Find:

a 24×5 **b** 37×4 **c** 62×8 **d** 29×10

e 372×10 **f** 52×100 **g** 63×1000 **h** 53×24

i 27×15 **j** 56×49 **k** 328×45 **l** 6427×36

m rua tekau ma iwa $\times$ wha tekau ma rima

Example 13

Find: **a** $256 \div 4$ **b** $326 \div 5$ **c** $2502 \div 6$ **d** $2300 \div 100$

a $4 \overline{)25^{1}6}$ $\quad 64$

b $5 \overline{)32^{2}5}$ $\quad 65$

c $6 \overline{)25^{1}0^{4}2}$ $\quad 417$

d $\dfrac{2300}{100} = 23$

3 Do these divisions:

a $3 \overline{)42}$ **b** $4 \overline{)216}$ **c** $8 \overline{)168}$ **d** $5 \overline{)375}$

e $10 \overline{)420}$ **f** $100 \overline{)3700}$ **g** $7 \overline{)6307}$ **h** $11 \overline{)6809}$

4 Find:

a $24 \div 4$ **b** $125 \div 5$ **c** $312 \div 6$ **d** $240 \div 5$

e $624 \div 3$ **f** $620 \div 10$ **g** $5400 \div 10$ **h** $3200 \div 100$

i $724\,000 \div 100$ **j** rima rau rima tekau $\div$ rima

Example 14

If one icecream costs me \$2, how much will six icecreams cost me?

Total cost is $\$2 \times 6 = \$12$

5 **a** Rangi lifted five 18 kg bags of potatoes onto a truck. How many kg of potatoes did he lift altogether?

b My three brothers and I received a gift of \$320. If we shared the money equally amongst ourselves how much did each person receive?

c A relay team of nine people took 738 minutes to complete a relay race. If each team member took exactly the same time how long did each team member take?

d This maths textbook is 245 mm long. If I put 10 books end to end how far would they stretch?

e 24 people each travelled 28 km to play sport. How far in total would they have travelled?

f If I write 8 words per minute how long would it take me to write 648 words?

g How much would June pay for waru ice buns if toru buns cost her rima tekau ma wah cents?

Estimation and Rounding

Example 15

Estimate the cost of 19 pens at \$1.95 each.

$19 \times \$1.95 \doteqdot 20 \times \$2$
$\doteqdot \$40$

EXERCISE 2E

1 Estimate the cost of:

a 195 exercise books at 98 cents each
b 27 packets of sweets at \$2.15 a packet
c 18 show bags at \$3.45 each
d 12 bottles of drink at \$2.95 a bottle
e 4 dozen iceblocks at \$1.20 each
f 3850 football tickets at \$6.50 each.

Example 16

Estimate the sum: $943 + 286 + 49$

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

$943 + 286 + 49$
$\doteqdot 900 + 300 + 50$
$\doteqdot 1250$

2 Estimate the following:

a	$75 + 63$	**b**	$91 - 66$	**c**	$24 + 49 + 37$
d	$396 + 215$	**e**	$2199 + 5743 + 1809$	**f**	$819 - 574$
g	$6932 - 3095$	**h**	$63 + 71 + 49 + 89 + 9$	**i**	$43\,896 + 38\,194$
j	$61\,871 - 40\,998$	**k**	$19\,999 - 10\,999$	**l**	$54\,540 + 30\,603$
m	$709\,846 + 208\,438$	**n**	$819\,483 + 678\,909$	**o**	$674\,320 - 67\,432$

Go back over the above exercises and compare your estimates with the exact answers.

Example 18

Estimate the product: **a** 57×8 **b** 537×6

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

57×8
$\doteqdot 60 \times 8$
$\doteqdot 480$

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

537×6
$\doteqdot 500 \times 6$
$\doteqdot 3000$

3 Estimate the following products:

a	79×4	**b**	47×8	**c**	62×7	**d**	92×9
e	88×6	**f**	55×3	**g**	37×5	**h**	29×8

4 Multiply the following. Use estimation to check that your answers are reasonable.

a	59×7	**b**	83×9	**c**	75×5	**d**	89×3

5 Estimate the products:

a	284×3	**b**	617×7	**c**	408×9	**d**	375×5
e	494×6	**f**	817×8	**g**	2094×7	**h**	8903×4

6 Multiply the following. Use estimation to check that your answers are reasonable.

a	679×7	**b**	445×8	**c**	3759×9	**d**	4108×6

Example 19

Estimate the product: 623×69

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

623×69
$\doteqdot 600 \times 70$ {3 zeros in the question}
$\doteqdot 42\,000$ {3 zeros in the answer}

The estimate tells us the correct answer should have 5 digits in it.

The sum of the number of zeros is the number of zeros which should appear in the product, unless the product of two digits ends in zero.

Example 20

Estimate the product: 387×891

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

$$\begin{aligned} & 387 \times 891 \\ \doteqdot\ & 400 \times 900 \quad \{4 \text{ zeros in the question}\} \\ \doteqdot\ & 360\,000 \quad \{4 \text{ zeros in the answer}\} \end{aligned}$$

In this case notice that the rounded numbers were both higher than the real value. We expect the answer to have 6 digits and it will be less than 360 000.

7 Estimate the following products using 1 figure approximations:

a	57×42	**b**	73×59	**c**	85×98
d	275×54	**e**	389×73	**f**	4971×32
g	3079×29	**h**	$40\,989 \times 9$	**i**	880×750

Example 21

Find the approximate value of the quotient of $3946 \div 79$.

$$\begin{aligned} 3946 \div 79 & \doteqdot 4000 \div 80 \\ & \doteqdot 400 \div 8 \\ & \doteqdot 50 \end{aligned}$$

8 Estimate the following quotients using 1 figure approximations:

a	$82 \div 4$	**b**	$103 \div 10$	**c**	$88 \div 3$
d	$397 \div 4$	**e**	$6849 \div 7$	**f**	$79\,095 \div 8$
g	$6000 \div 19$	**h**	$80\,000 \div 37$	**i**	$18\,700 \div 97$
j	$549 \div 49$	**k**	$3038 \div 28$	**l**	$5899 \div 30$

9 Use estimation to find which of these calculator answers is reasonable:

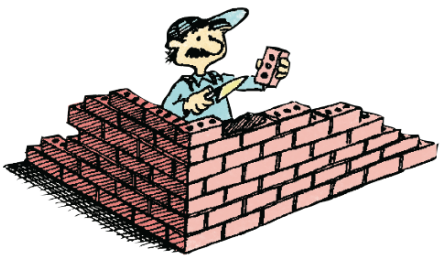
a	489×19	9291	96 081	92 901
b	843×74	56 382	560 382	62 38
c	3907×89	347 723	5 361 243	35 723
d	$3132 \div 87$	3600	36	306

10 In the following questions, round the given data to one figure to find the approximate value asked for:

a In her bookcase Lynda has 12 shelves. Estimate the number of books in the bookcase if there are approximately 40 books on each shelf.

b Miki reads 217 words in a minute. Estimate the number of words she can read in one hour.

c A bricklayer lays 115 bricks each hour. If he works a $37\frac{1}{2}$ hour week, approximately how many bricks will he lay in one month?



d If Joe can type at 52 words per minute, find an approximate time for him to type a document of 3820 words.

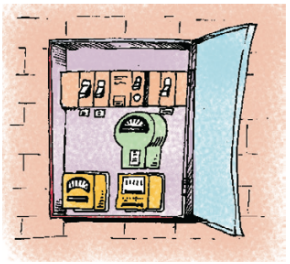
e In a vineyard there are 189 vines in each row. There are 54 rows. Find the approximate number of vines in the vineyard.

f One of New Zealand's largest wineries bottles 480 000 cases of wine each year. If each case holds one dozen bottles, approximately how many bottles of wine are produced each year?

g If a trip of 1423 km from Cape Reinga to Wellington took 19 hours, find the approximate average speed in kilometres per hour.

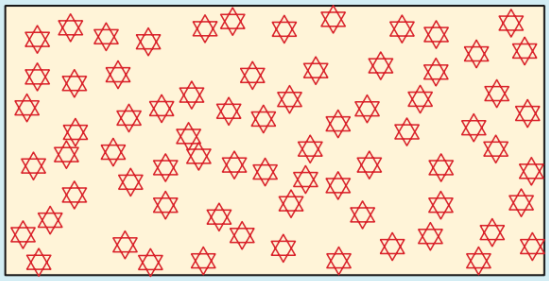
h A cinema complex has waru theatres with seating for whâ rau in each theatre. Each theatre has whâ screenings every day during the school holidays. Estimate the total attendance of the complex if all the theatres are approximately $\frac{3}{4}$ full for each screening.

i An electricity supply company employs 19 people to read meters. If each reader takes approximately 3 minutes to read one meter, estimate how many meters are read each hour.

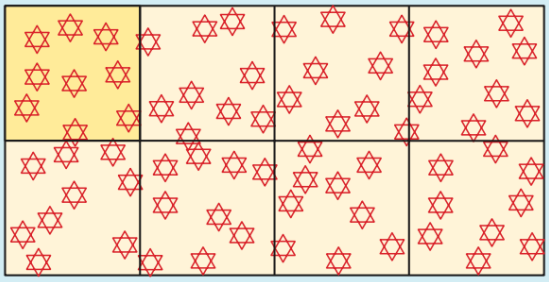


Example 22

Estimate the number of stars on the poster:



Step 1: Divide the poster into equal parts as shown.



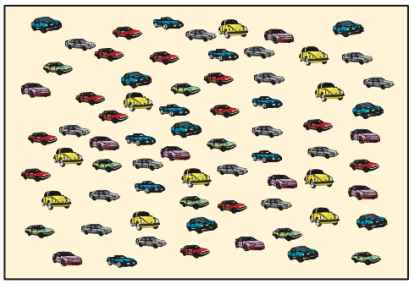
Step 2: Count the number of stars in one part.

Step 3: Multiply the stars in one part by the total number of parts.
Number of stars in 1 part $\times$ number of parts $= 9 \times 8 = 72$ stars.

Estimate: 72 stars are displayed on the poster.

11 Using the method outlined in **Example 22**, estimate the following:

a number of cars in a parking lot



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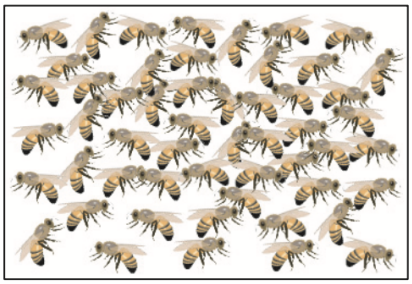
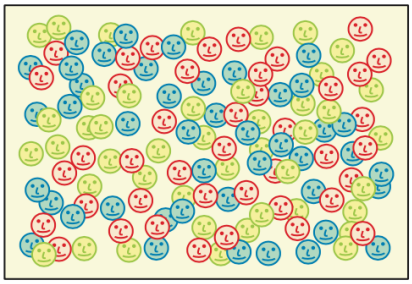
b number of bees swarming



c number of faces in a crowd



d number of leaves