EXERCISE 5B.1

1 Write as a whole number:

a $\frac{15}{3}$ **b** $\frac{20}{4}$ **c** $\frac{15}{5}$ **d** $\frac{40}{4}$

e $\frac{20}{5}$ **f** $\frac{20}{2}$ **g** $\frac{20}{10}$ **h** $\frac{20}{1}$

i $\frac{20}{20}$ **j** $\frac{45}{9}$ **k** $\frac{125}{25}$ **l** $\frac{63}{7}$

2 Write as a mixed number:

a $\frac{5}{3}$ **b** $\frac{7}{5}$ **c** $\frac{11}{4}$ **d** $\frac{19}{6}$

e $\frac{17}{2}$ **f** $\frac{17}{3}$ **g** $\frac{13}{7}$ **h** $\frac{16}{9}$

i $\frac{22}{7}$ **j** $\frac{25}{4}$ **k** $\frac{31}{3}$ **l** $\frac{106}{11}$

EXERCISE 5B.2

1 Use your calculator to convert to a mixed number:

a $\frac{22}{9}$ **b** $\frac{57}{17}$ **c** $\frac{63}{15}$ **d** $\frac{118}{27}$

2 Use your calculator to write as an improper fraction:

a $4\frac{11}{13}$ **b** $5\frac{3}{22}$ **c** $8\frac{5}{17}$ **d** $13\frac{19}{24}$

4 Geraldine High School has 29 students to be put into volleyball teams. Each team has six players in it.

a Write $\frac{29}{6}$ as a mixed number.

b How many complete volleyball teams can be made?

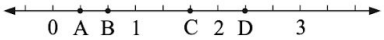
5 Asika had 15 m of ribbon which she cut into four equal lengths. Express the length of each ribbon as a mixed number of metres.

EXERCISE 5C

1 Find number fractions (rational numbers) represented by points A, B, C and D on the number lines:

a

b



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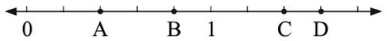

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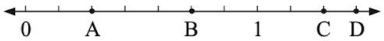


2 Draw number line graphs for the following sets of fractions:

a $\frac{1}{3}, 1\frac{2}{3}, \frac{7}{3}$ **b** $\frac{2}{5}, \frac{4}{5}, 1\frac{2}{5}$ **c** $\frac{1}{6}, \frac{5}{6}, 1\frac{1}{6}$

d $\frac{1}{8}, \frac{3}{8}, \frac{7}{8}, 1\frac{1}{8}$ **e** $\frac{1}{12}, \frac{5}{12}, \frac{7}{12}, \frac{13}{12}$

4 Express with denominator 20:

a $\frac{1}{2}$ **b** $\frac{4}{5}$ **c** $\frac{3}{4}$ **d** $\frac{17}{10}$

e $\frac{1}{4}$ **f** $\frac{3}{2}$ **g** 1 **h** $\frac{3}{5}$

5 Express in sixteenths:

a $\frac{1}{8}$ **b** $\frac{3}{4}$ **c** 1 **d** 0

e $\frac{9}{8}$ **f** $\frac{3}{2}$ **g** $\frac{11}{4}$ **h** 2

6 Express in hundredths:

a $\frac{1}{2}$ **b** $\frac{1}{4}$ **c** $\frac{3}{5}$ **d** $\frac{13}{10}$

e $\frac{4}{25}$ **f** $\frac{17}{50}$ **g** $\frac{19}{20}$ **h** 3

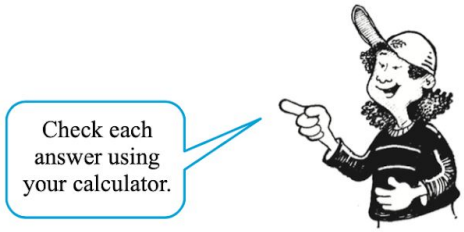
8 Find Δ if:

a $\frac{3}{5} = \frac{15}{\Delta}$ **b** $\frac{7}{12} = \frac{49}{\Delta}$ **c** $\frac{6}{\Delta} = \frac{3}{2}$ **d** $\frac{12}{\Delta} = \frac{4}{3}$

e $\frac{9}{7} = \frac{36}{\Delta}$ **f** $\frac{64}{\Delta} = \frac{8}{9}$ **g** $\frac{8}{5} = \frac{24}{\Delta}$ **h** $\frac{81}{\Delta} = \frac{9}{10}$

EXERCISE 5D.2

1 Reduce to simplest form by removing common factors:



a $\frac{15}{30}$ **b** $\frac{5}{15}$ **c** $\frac{9}{12}$

d $\frac{20}{24}$ **e** $\frac{8}{14}$ **f** $\frac{6}{10}$

g $\frac{7}{21}$ **h** $\frac{32}{40}$ **i** $\frac{15}{35}$ **j** $\frac{20}{4}$

k $\frac{35}{60}$ **l** $\frac{50}{15}$ **m** $\frac{33}{77}$ **n** $\frac{20}{36}$ **o** $\frac{21}{56}$

p $\frac{81}{27}$ **q** $\frac{35}{25}$ **r** $\frac{300}{1000}$ **s** $\frac{160}{200}$ **t** $\frac{56}{200}$

3 What fraction of:

a	24 kg is 8 kg	**b**	\$36 is \$24	**c**	72 kg is 63 kg
d	\$2 is 60 cents	**e**	1 m is 60 cm	**f**	1 m is 750 mm
g	1 day is 3 hours	**h**	\$5 is \$1.50	**i**	1 km is 200 m
j	10 cm is 17 mm	**k**	35 kg is 7 kg	**l**	2 tonne is 400 kg
m	2 weeks is 3 days	**n**	2 kg is 450 g	**o**	1 m is 35 mm?

4 John cut off 6 cm from a 60 cm length of rope. What fraction of the rope did he cut off?

5 Jessica lost 500 grams of weight from her original weight of 70 kg. What fraction of her weight did she lose?

Adding Fractions

4 Find:

a	$\frac{1}{5}+\frac{1}{2}+\frac{1}{6}$	**b**	$\frac{1}{2}+\frac{1}{4}+\frac{2}{5}$	**c**	$\frac{1}{4}+\frac{1}{3}+\frac{1}{2}$
d	$\frac{2}{3}+\frac{1}{6}+\frac{1}{2}$	**e**	$\frac{2}{5}+\frac{3}{10}+\frac{1}{2}$	**f**	$\frac{3}{4}+\frac{1}{2}+\frac{7}{12}$

5 **a** Carly eats $\frac{1}{8}$ of a pizza, Su-Lin eats $\frac{2}{5}$ and Terri eats $\frac{1}{4}$. How much of the pizza has been eaten?

b Keri scored $\frac{1}{5}$ of the team's goals, Tamara $\frac{1}{4}$ of the goals and Joan $\frac{1}{3}$ of the goals. What fraction of the total goals scored by the team did the three girls score together.

Adding Mixed Fractions

EXERCISE 5F.2

1 Find:

a	$1\frac{1}{6}+2\frac{1}{3}$	**b**	$2\frac{1}{3}+\frac{7}{12}$	**c**	$1\frac{1}{3}+3\frac{5}{6}$
d	$1\frac{7}{8}+\frac{4}{5}$	**e**	$2\frac{1}{4}+2\frac{3}{5}$	**f**	$1\frac{1}{4}+3\frac{2}{3}$
g	$3\frac{1}{2}+2\frac{2}{3}$	**h**	$2\frac{2}{3}+4\frac{1}{5}$	**i**	$5\frac{7}{8}+2\frac{1}{4}$

2 Sarah is an artist. She spends $3\frac{1}{2}$ hours on Saturday painting a portrait and a further $2\frac{1}{3}$ hours finishing it off on Sunday. How long did it take her to paint the portrait?

Subtracting Fractions

4 Find:

a $\frac{2}{3} - \frac{1}{6}$	**b** $\frac{5}{6} - \frac{2}{3}$	**c** $\frac{3}{8} - \frac{1}{4}$
d $\frac{3}{4} - \frac{3}{8}$	**e** $\frac{7}{8} - \frac{3}{4}$	**f** $\frac{1}{3} - \frac{1}{4}$
g $\frac{4}{5} - \frac{1}{3}$	**h** $\frac{3}{4} - \frac{2}{3}$	**i** $\frac{4}{5} - \frac{1}{4}$

5 **a** Ranui has a freshly baked cake. He gives Tainui $\frac{3}{5}$ of it. How much has he left?

b Ranui bakes another cake and gives Chantelle $\frac{3}{4}$ of it and Billie $\frac{1}{8}$ of it. How much does Ranui have left for himself now?

6 $\frac{1}{5}$ of the soccer team were sick and could not play and another $\frac{1}{4}$ had minor colds but were able to play. What fraction of the team were healthy?

7 Find:

a $\frac{9}{10} - \frac{1}{5} - \frac{1}{2}$	**b** $\frac{5}{6} - \frac{1}{3} - \frac{1}{2}$	**c** $\frac{7}{8} - \frac{1}{4} - \frac{1}{2}$
d $1 - \frac{1}{3} - \frac{1}{4}$	**e** $\frac{1}{4} + \frac{1}{6} - \frac{1}{8}$	**f** $\frac{3}{4} + \frac{5}{6} - \frac{2}{3}$

8 Shaggy leaves $\frac{1}{3}$ of his fortune to Scooby, $\frac{2}{5}$ to Josie and the rest to Ian. What fraction does Ian get?

9 Bob owns $\frac{3}{4}$ of a business, Kim owns $\frac{1}{6}$ and Mark owns the rest. What fraction does Mark own?

7 Find:

a $\frac{1}{3} \times \frac{6}{7}$	**b** $\frac{3}{4} \times \frac{1}{6}$	**c** $\frac{2}{3}$ of $\frac{3}{4}$	**d** $\frac{1}{2}$ of $\frac{4}{3}$
e $\frac{3}{4} \times 24$	**f** $\frac{2}{5}$ of 30	**g** $\frac{1}{2} \times 4$	**h** $\frac{2}{3}$ of 12
i $5 \times \frac{2}{3}$	**j** $15 \times \frac{3}{5}$	**k** $\frac{3}{7}$ of 35	**l** $2 \times \frac{1}{4}$
m $3 \times \frac{11}{3}$	**n** $1\frac{1}{4} \times 8$	**o** $\frac{4}{5}$ of 25	**p** $20 \times \frac{3}{4}$
q $\frac{5}{8} \times 24$	**r** $64 \times \frac{3}{8}$	**s** $\frac{7}{10}$ of 30	**t** $\frac{5}{12}$ of 600

8 Frank drinks $\frac{1}{4}$ of a 600 mL cola. How much does he drink?

9 Suzi needs 4 pieces of wood that are each $2\frac{3}{5}$ m long. What is the total length required?

10 Amanda eats $\frac{3}{4}$ of half a pizza. What fraction of the total does she eat?

11 Use your calculator to evaluate:

a $\frac{3}{14} \times \frac{5}{16}$	**b** $\frac{4}{17} \times \frac{1}{12}$	**c** $2\frac{1}{5} \times \frac{3}{40}$	**d** $\frac{2}{23} \times 4\frac{1}{2}$
e $1\frac{1}{2} \times \frac{5}{18}$	**f** $(2\frac{1}{3})^2$	**g** $(1\frac{1}{2})^3$	**h** $2\frac{1}{3} \times 3\frac{3}{40}$

3 Find:

a $\frac{1}{3} \div 3\frac{1}{3}$	**b** $1\frac{2}{3} \div 2\frac{1}{2}$	**c** $2\frac{1}{2} \div 1\frac{1}{3}$	**d** $3\frac{1}{5} \div 1\frac{1}{2}$
e $1\frac{1}{2} \div 3\frac{1}{5}$	**f** $3\frac{3}{4} \div \frac{7}{12}$	**g** $2\frac{7}{12} \div \frac{3}{4}$	**h** $\frac{1}{5} \div 2\frac{1}{3}$

4 Roger takes $\frac{1}{5}$ of an hour to jog around the block.
How many laps of the block can he complete in $1\frac{1}{2}$ hours?

5 Kylie's stride length is $1\frac{1}{3}$ m. How many strides does it take her to walk 24 m?

Problem Solving

EXERCISE 5K

1 Find the sum of $\frac{2}{3}$ and $\frac{3}{4}$.

2 Find $\frac{7}{12}$ of my investment of \$180 000.

3 What number must $\frac{3}{4}$ be multiplied by to get an answer of 15? [**Hint:** Find $15 \div \frac{3}{4}$.]

4 By how much does $\frac{4}{5}$ exceed $\frac{7}{12}$?

5 In a pig-pen containing 36 piglets, what fraction are males if 16 are female?

6 Which is the better score in a mathematics test: A: 17 out of 20 or B: 21 out of 25?

7 Find $\frac{2}{5}$ of \$2.45

8 How many $2\frac{1}{3}$ m lengths of rope can be cut from a rope of length 21 m?

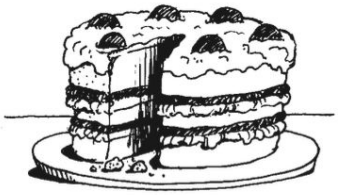
9 Five pieces of material each of length $3\frac{3}{4}$ m are required. Find the total length.

10 On consecutive days you eat $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{5}$ of a cake.

a What fraction has been eaten? **b** What fraction remains?

11 What is the difference between $\frac{3}{7}$ and $\frac{2}{5}$?

12 $\frac{2}{5}$ of a cake remains and is shared equally by 4 children. What fraction of the original cake does each child get?



13 A race track is $3\frac{3}{4}$ km long. How many circuits are necessary to complete a 100 km race?

14 Mouldy Oldy leaves $\frac{1}{3}$ of his money to his son, $\frac{3}{8}$ of it to his wife and the rest to the Heart Foundation. What fraction is left to the Heart Foundation?

15 A marathon swimmer swims $\frac{3}{7}$ of the race distance in the first hour and $\frac{2}{5}$ in the second hour. What fraction of the race has the swimmer left to swim?

16 If I used $\frac{3}{5}$ of a 4 litre can of petrol and $\frac{3}{4}$ of a 10 litre can, how much petrol did I use altogether?

17 A man has \$480 to take home each week. He banks $\frac{1}{8}$ of it, gives $\frac{1}{3}$ of it to his wife and pays \$100 rent out of what remains. How much of his weekly take-home pay is left?

18 A man's estate is valued at \$216 000. On his death his widow is to receive $\frac{1}{4}$ of the estate, and his 4 children are to receive equal shares of the remainder. What fraction does each child receive and how much is it in money terms?

Answers to Problem Solving

EXERCISE 5K

1 $1\frac{5}{12}$ **2** \$105 000 **3** 20 **4** $\frac{13}{60}$ **5** $\frac{5}{9}$ **6** A

7 98 cents **8** 9 lengths **9** $18\frac{3}{4}$ m

10 **a** $\frac{47}{60}$ **b** $\frac{13}{60}$ **11** $\frac{1}{35}$ **12** $\frac{1}{10}$ **13** $26\frac{2}{3}$ laps

14 $\frac{7}{24}$ **15** $\frac{6}{35}$ **16** $9\frac{9}{10}$ litres **17** \$160

18 $\frac{3}{16}$, \$40 500 **19** **a** $\frac{1}{12}$ **b** $\frac{5}{24}$ **20** $\frac{2}{5}$ m