S1 Block Test Two
Revision Booklet
MP1

Fractions

Exercise 1 Revision

1. Find two equivalent fractions for each of the following :-

a $\frac{1}{2}$	b $\frac{1}{3}$	c $\frac{1}{8}$	d $\frac{1}{100}$
e $\frac{2}{3}$	f $\frac{2}{5}$	g $\frac{3}{7}$	h $\frac{11}{12}$.

2. Simplify fully (where possible) :-

a $\frac{2}{4}$	b $\frac{6}{9}$	c $\frac{15}{21}$	d $\frac{24}{36}$
e $\frac{11}{88}$	f $\frac{75}{100}$	g $\frac{17}{51}$	h $\frac{122}{144}$.

3. Write each of the following as fractions and simplify fully :-

a At first year assembly there were 124 boys out of 240 pupils.

b At a school fire drill there were 1650 people in the playground.
There were one hundred and fifty adults.

Exercise 2 Top-Heavy & Mixed Fractions

1. Change each of the following **top heavy fractions** to **mixed numbers** :-

a $\frac{3}{2}$	b $\frac{11}{2}$	c $\frac{17}{3}$	d $\frac{49}{6}$
e $\frac{111}{10}$	f $\frac{73}{9}$	g $\frac{204}{5}$	h $\frac{161}{12}$.

2. 51 kg of potatoes are packed evenly into 9 bags.
What is the weight of each bag ?

3. Change each of these into **mixed numbers** and **simplify** fully where possible :-

a $\frac{18}{4}$	b $\frac{33}{6}$	c $\frac{145}{10}$	d $\frac{68}{8}$
e $\frac{122}{4}$	f $\frac{315}{25}$	g $\frac{3333}{6}$	h $\frac{147}{12}$.

4. a How many $\frac{1}{2}$ pizza slices can you get from $5\frac{1}{2}$ pizzas ?

b How many $\frac{1}{3}$ pizza slices can you get from $7\frac{2}{3}$ pizzas ?

c How many $\frac{1}{6}$ pizza slices can you get from $4\frac{1}{2}$ pizzas ?

Fractions

5. Change each of the following **mixed numbers** to **top heavy fractions** :-

a $3\frac{1}{6}$ b $6\frac{1}{3}$ c $1\frac{2}{3}$ d $13\frac{4}{5}$

e $8\frac{3}{4}$ f $11\frac{2}{11}$ g $17\frac{3}{7}$ h $81\frac{3}{5}$.

Exercise 3 Adding & Subtracting (basic) Fractions

1. Find and simplify fully where possible :-

a $\frac{1}{2} + \frac{1}{4}$ b $\frac{1}{4} + \frac{1}{4}$ c $\frac{3}{5} + \frac{1}{5}$ d $\frac{7}{11} + \frac{4}{11}$

e $\frac{3}{5} - \frac{1}{5}$ f $\frac{7}{8} - \frac{3}{8}$ g $4\frac{1}{4} + \frac{1}{4}$ h $7\frac{3}{5} + 1\frac{1}{5}$

i $8\frac{3}{8} + 2\frac{1}{8}$ j $9 - 4\frac{1}{4}$ k $7\frac{5}{9} + 2\frac{4}{9}$ l $5\frac{1}{2} - 1\frac{1}{4}$.

2. Two carafes of wine were poured into a punch bowl.

One carafe held $\frac{5}{8}$ a litre of wine and the other held $\frac{1}{8}$ litres.

a How much wine is now in the bowl ?

b How much more wine did the first carafe hold than the second ?

3. A room is $9\frac{3}{4}$ metres long by $6\frac{1}{4}$ metres wide.

a How much **longer** is the length than the breadth ?

b Find the perimeter of the room.

Exercise 4 Adding & Subtracting (harder) Fractions

1. Calculate :-

a $\frac{1}{2} + \frac{1}{4}$ b $\frac{1}{3} + \frac{1}{4}$ c $\frac{3}{5} + \frac{3}{4}$ d $\frac{2}{3} + \frac{3}{8}$

e $\frac{3}{4} - \frac{1}{3}$ f $\frac{7}{8} - \frac{2}{3}$ g $\frac{4}{5} - \frac{2}{7}$ h $\frac{8}{9} + \frac{3}{5}$

i $\frac{1}{12} + \frac{1}{13}$ j $\frac{7}{8} - \frac{9}{11}$ k $\frac{6}{13} + \frac{15}{52}$ l $\frac{5}{6} - \frac{3}{8}$.

2. Find :-

a $5 - 3\frac{1}{2}$ b $12 - 6\frac{1}{14}$ c $6\frac{2}{3} - 1\frac{1}{4}$ d $7\frac{4}{5} - 5\frac{3}{4}$

e $10\frac{7}{8} - 7\frac{2}{3}$ f $81\frac{1}{2} - 77\frac{3}{4}$ g $6\frac{3}{5} - 4\frac{7}{8}$ h $2\frac{1}{2} - 1\frac{7}{9}$.

Fractions

1. Write down **three** equivalent fractions for :-

   a $\frac{1}{3}$ b $\frac{2}{5}$ c $\frac{9}{10}$ d $\frac{11}{17}$.

2. Change each of the following to a top heavy fraction :-

   a $5\frac{1}{2}$ b $4\frac{2}{3}$ c $8\frac{2}{7}$ d $1\frac{9}{11}$.

3. Change each of the following to a mixed number :-

   a $\frac{11}{3}$ b $\frac{20}{7}$ c $\frac{101}{9}$ d $\frac{75}{10}$.

4. Find and simplify fully where possible :-

   a $\frac{1}{2} + \frac{1}{5}$ b $1\frac{1}{3} + 1\frac{1}{2}$ c $3\frac{1}{3} + 2\frac{2}{5}$ d $14 - 6\frac{1}{2}$

   e $4\frac{1}{2} - 2\frac{2}{7}$ f $7\frac{9}{10} - 5\frac{2}{3}$ g $8\frac{1}{4} - 5\frac{2}{3}$ h $9\frac{1}{3} - 5\frac{2}{5}$

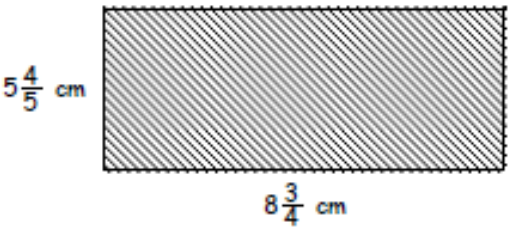
   i $7\frac{1}{5} + 1\frac{2}{3}$ j $11\frac{3}{4} + 8\frac{7}{9}$ k $5\frac{1}{9} - 3\frac{3}{5}$ l $9\frac{5}{6} - 8\frac{13}{18}$.

5. Jamie wanted to run $10\frac{1}{2}$ km during his race practice.
   He only managed to run $8\frac{5}{8}$ km.

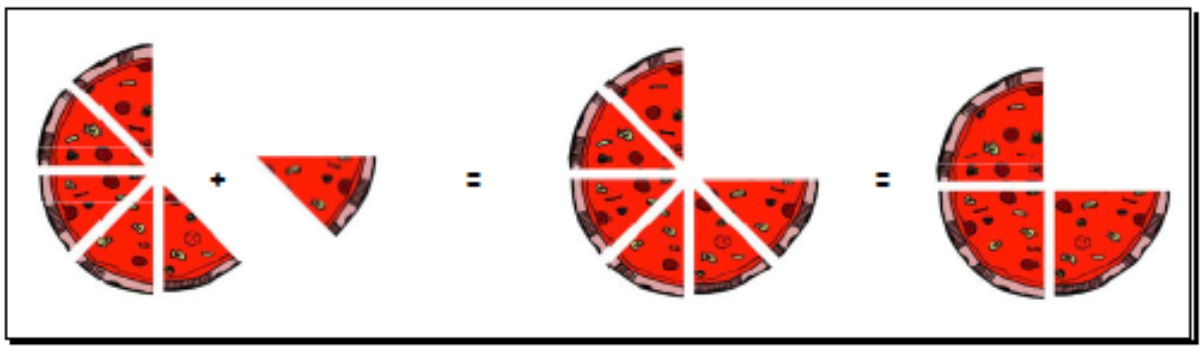
   How far short was he of completing his practice ?

6. a Calculate the perimeter of the rectangle shown.

   b How much longer is the length than the breadth ?



7. Write the sum represented by the diagram below :-



Answers

Exercise 1 - Revision

1. a $^{2}/_{4}$, $^{3}/_{6}$ b $^{2}/_{6}$, $^{3}/_{9}$
   c $^{2}/_{16}$, $^{3}/_{24}$ d $^{2}/_{200}$ $^{3}/_{300}$
   e $^{4}/_{6}$, $^{6}/_{9}$ f $^{4}/_{10}$, $^{6}/_{15}$
   g $^{6}/_{14}$, $^{9}/_{21}$ h $^{22}/_{24}$, $^{33}/_{36}$
2. a $^{1}/_{2}$ b $^{2}/_{3}$ c $^{5}/_{7}$ d $^{2}/_{3}$
   d $^{1}/_{8}$ f $^{3}/_{4}$ g $^{1}/_{3}$ h $^{61}/_{72}$
3. a $^{124}/_{240} = ^{31}/_{60}$ b $^{150}/_{1650} = ^{1}/_{11}$

Exercise 2 - Top-Heavy and Mixed Fractions

1. a $1^{1}/_{2}$ b $5^{1}/_{2}$ c $5^{2}/_{3}$ d $8^{1}/_{6}$
   e $11^{1}/_{10}$ f $8^{1}/_{9}$ g $40^{4}/_{5}$ h $13^{5}/_{12}$
2. $5^{2}/_{3}$ kg
3. a $4^{1}/_{2}$ b $5^{1}/_{2}$ c $14^{1}/_{2}$ d $8^{1}/_{2}$
   e $30^{1}/_{2}$ f $12^{3}/_{5}$ g $555^{1}/_{2}$ h $12^{1}/_{4}$
4. a 11 b 23 c 27
5. a $^{19}/_{6}$ b $^{19}/_{3}$ c $^{5}/_{3}$ d $^{69}/_{5}$
   e $^{35}/_{4}$ f $^{123}/_{11}$ g $^{122}/_{7}$ h $^{408}/_{5}$

Exercise 3 - Add/Subtract Basic Fractions

1. a $^{3}/_{4}$ b $^{1}/_{2}$ c $^{4}/_{5}$ d 1
   e $^{2}/_{5}$ f $^{1}/_{2}$ g $4^{1}/_{2}$ h $8^{4}/_{5}$
   i $10^{1}/_{2}$ j $4^{3}/_{4}$ k 10 l $4^{1}/_{4}$
2. a $^{3}/_{4}$ litre b $^{1}/_{2}$ litre
3. a $3^{1}/_{2}$ m b 32 m

Exercise 4 - Add/Subtract Harder Fractions

1. a $^{3}/_{4}$ b $^{7}/_{12}$ c $1^{7}/_{20}$ d $1^{1}/_{24}$
   e $^{5}/_{12}$ f $^{5}/_{24}$ g $^{18}/_{35}$ h $1^{22}/_{45}$
   i $^{25}/_{156}$ j $^{5}/_{88}$ k $^{3}/_{4}$ l $^{11}/_{24}$
2. a $1^{1}/_{2}$ b $5^{13}/_{14}$ c $5^{5}/_{12}$ d $2^{1}/_{20}$
   e $3^{5}/_{24}$ f $3^{3}/_{4}$ g $1^{29}/_{40}$ h $^{13}/_{18}$

Review - Revisit - Revise Exercise 9

1. a $^{2}/_{6}$, $^{3}/_{9}$ b $^{4}/_{10}$, $^{6}/_{15}$
   c $^{18}/_{20}$, $^{27}/_{30}$ d $^{22}/_{34}$, $^{33}/_{51}$
2. a $^{11}/_{2}$ b $^{14}/_{3}$ c $^{68}/_{7}$ d $^{20}/_{11}$
3. a $3^{2}/_{3}$ b $2^{6}/_{7}$ c $11^{2}/_{9}$ d $7^{1}/_{2}$
4. a $^{7}/_{10}$ b $2^{5}/_{6}$ c $5^{11}/_{15}$ d $7^{1}/_{2}$
   e $2^{3}/_{14}$ f $2^{7}/_{30}$ g $2^{7}/_{12}$ h $3^{14}/_{15}$
   i $8^{13}/_{15}$ j $20^{19}/_{36}$ k $1^{23}/_{45}$ l $1^{1}/_{9}$
5. $1^{7}/_{8}$ km
6. a $29^{1}/_{10}$ cm b $2^{19}/_{20}$ cm
7. $^{5}/_{8} + ^{1}/_{8} = ^{6}/_{8} = ^{3}/_{4}$

More Fractions

Exercise 1 — Multiplying Fractions

1. **Copy** the following and complete :-

$$\frac{2}{3} \times \frac{5}{6}$$
$$= \frac{2 \times 5}{3 \times 6}$$
$$= \frac{?}{18} = \frac{?}{?}.$$

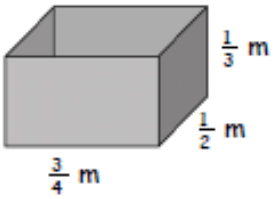
2. **Multiply** the following fractions and simplify (where possible) :-

a $\frac{3}{5} \times \frac{3}{4}$ b $\frac{7}{10} \times \frac{5}{8}$ c $\frac{3}{4} \times \frac{7}{9}$ d $\frac{6}{7} \times \frac{1}{6}$

e $\frac{3}{4} \times \frac{3}{4} \times \frac{2}{3}$ f $\frac{6}{7} \times \frac{7}{9} \times \frac{3}{8}$ g $\frac{3}{10} \times \frac{5}{6} \times \frac{2}{3}$ h $\frac{1}{11} \times \frac{2}{5} \times \frac{7}{8}$.

3. Calculate the **area** of a square with side $\frac{5}{8}$ metre.

4. A cuboid has dimensions as shown.
Find the volume of this cuboid in cubic metres.



5. Do the following and *simplify wherever possible* :-

a $1\frac{3}{5} \times 2\frac{3}{4}$ b $2\frac{1}{3} \times 5\frac{1}{2}$ c $7\frac{1}{2} \times 2\frac{1}{3}$ d $1\frac{2}{5} \times 2\frac{1}{2}$

e $4\frac{1}{2} \times 2\frac{1}{5}$ f $2\frac{3}{5} \times 3\frac{3}{4}$ g $1\frac{1}{10} \times 1\frac{1}{6}$ h $6\frac{1}{3} \times \frac{15}{19}$.

6. 

A one metre length of pipe weighs $9\frac{3}{5}$ kg.
What would a $2\frac{1}{2}$ metre length of pipe weigh ?

Exercise 2 — Division of Fractions

1. **Divide** the following fractions and simplify (where possible) :-

a $\frac{3}{4} \div \frac{3}{5}$ b $\frac{7}{9} \div \frac{7}{8}$ c $\frac{2}{3} \div \frac{4}{9}$ d $\frac{5}{7} \div \frac{4}{7}$

e $\frac{7}{12} \div \frac{5}{6}$ f $\frac{8}{9} \div \frac{2}{3}$ g $\frac{13}{15} \div \frac{3}{5}$ h $\frac{1}{4} \div \frac{1}{8}$

i $\frac{4}{7} \div \frac{7}{8}$ j $\frac{9}{16} \div \frac{3}{4}$ k $\frac{12}{21} \div \frac{3}{7}$ l $\frac{1}{4} \div \frac{1}{5}$.

2. a How many $\frac{1}{10}$'s are there in $\frac{3}{5}$'s ?

b How many strips of wood $\frac{1}{12}$ metre long, can I cut from a piece $\frac{5}{6}$ metre long ?

More Fractions

3. Find the following :- (*Simplify if possible*) :-

a $3\frac{1}{2} \div 1\frac{1}{6}$ b $1\frac{1}{3} \div 1\frac{1}{4}$ c $4\frac{1}{2} \div 2\frac{2}{3}$ d $1\frac{1}{6} \div 1\frac{3}{4}$

e $3\frac{1}{3} \div 2\frac{6}{7}$ f $2\frac{2}{3} \div 1\frac{3}{5}$ g $8 \div 2\frac{2}{3}$ h $11 \div \frac{3}{4}$.

4. The area of a rectangular garden is $17\frac{1}{2}$ square metres.
It is $7\frac{1}{2}$ metres long . Calculate its width.

Exercise 3 Mixed Exercise

1. Change to a mixed number :- a $\frac{12}{5}$ b $\frac{53}{6}$.

2. Rewrite as a top-heavy fraction :- a $7\frac{5}{6}$ b $11\frac{3}{4}$.

3. How many $\frac{1}{5}$ pizza slices can by sold from $4\frac{3}{5}$ pizzas ?

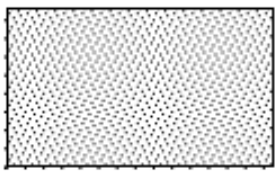
4. Copy and complete :-

a $\frac{5}{9} + \frac{2}{9}$ b $\frac{5}{7} - \frac{3}{7}$ c $4\frac{5}{6} + 2\frac{3}{4}$ d $12\frac{3}{4} - 7\frac{6}{7}$.

5. Copy and complete :-

a $\frac{1}{4} \times \frac{1}{5}$ b $3\frac{1}{5} \times 2\frac{3}{4}$ c $\frac{3}{4} \div \frac{1}{4}$ d $10\frac{1}{2} \div 2\frac{1}{3}$.

6. An empty metal cage weighs $4\frac{3}{7}$ kg.
It holds 8 large watermelons.
Each watermelon weighs $1\frac{5}{6}$ kg.
Calculate the total weight of the cage and watermelons.

7. 

$1\frac{1}{4}$ cm

The area of this rectangle is $3\frac{1}{3}$ cm^2.
Its breadth is $1\frac{1}{4}$ cm.
Calculate its length.

8. Find :- $\frac{9}{10} \times \frac{8}{9} \times \frac{7}{8} \times \frac{6}{7} \times \frac{4}{5} \times \frac{3}{4} \times \frac{2}{3}$.

Answers

Ch 8 Ex 1 Multiplying Fractions

1. $^{10}/_{18} = {}^{5}/_{9}$
2. a $^{9}/_{20}$ b $^{7}/_{16}$ c $^{7}/_{12}$
   d $^{1}/_{7}$ e $^{3}/_{8}$ f $^{1}/_{4}$
   g $^{1}/_{6}$ h $^{7}/_{220}$
3. $^{25}/_{64}$ sq m
4. $^{1}/_{8}$ cubic m
5. a $4\,^{2}/_{5}$ b $12\,^{5}/_{6}$ c $17\,^{1}/_{2}$
   d $3\,^{1}/_{2}$ e $9\,^{9}/_{10}$ f 9
   g $1\,^{17}/_{60}$ h 5
6. 24 kg

Ch 8 Ex 2 Division of Fractions

1. a $^{5}/_{4}$ b $^{8}/_{9}$ c $^{3}/_{2}$
   d $^{5}/_{4}$ e $^{7}/_{10}$ f $^{4}/_{3}$
   g $^{13}/_{15}$ h 2 i $^{32}/_{49}$
   j $^{3}/_{4}$ k $^{4}/_{3}$ l $^{5}/_{4}$
2. a 6 b 10
3. a 3 b $1\,^{1}/_{15}$ c $1\,^{11}/_{16}$
   d $^{2}/_{3}$ e $1\,^{1}/_{6}$ f $1\,^{2}/_{3}$
   g 3 h $14\,^{2}/_{3}$
4. $2\,^{1}/_{3}$ m

Ch 8 Ex 3 Mixed Exercise

1. a $2\,^{2}/_{5}$ b $8\,^{5}/_{6}$
2. a $^{47}/_{6}$ b $^{47}/_{4}$
3. 23
4. a $^{7}/_{9}$ b $^{2}/_{7}$
   c $7\,^{7}/_{12}$ d $4\,^{25}/_{28}$
5. a $^{1}/_{20}$ b $8\,^{4}/_{5}$
   c 3 d $4^{1}/_{2}$
6. $19\,^{2}/_{21}$
7. $2\,^{2}/_{3}$ cm
8. $^{1}/_{5}$

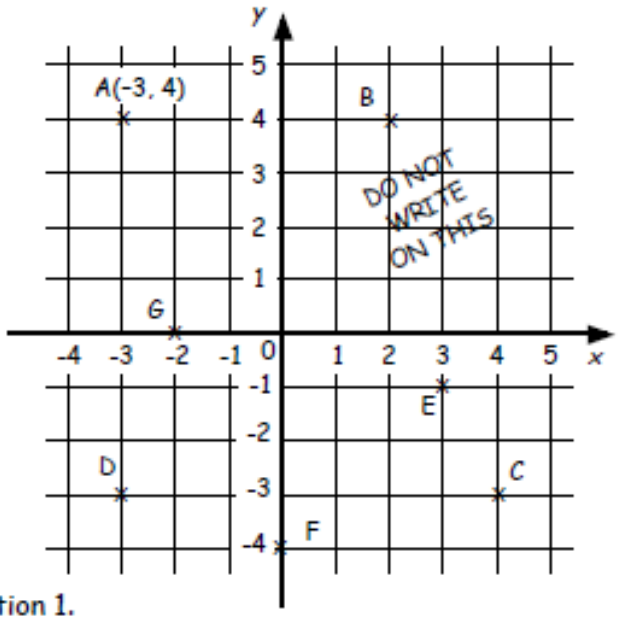
Ch 8 Revisit – Review – Revise 8

1. a $5\,^{1}/_{3}$ b $7\,^{7}/_{9}$
   c $14\,^{2}/_{7}$ d $3\,^{1}/_{2}$
2. a $^{13}/_{6}$ b $^{14}/_{3}$
   c $^{63}/_{4}$ d $^{98}/_{9}$
3. 23
4. a $^{1}/_{12}$ b $^{1}/_{2}$ c $^{16}/_{27}$
   d $^{7}/_{20}$ e $5\,^{1}/_{2}$ f 8
   g $4\,^{2}/_{3}$ h $13\,^{1}/_{3}$
5. a 6 b $1\,^{1}/_{3}$ c $^{8}/_{9}$
   d $^{1}/_{2}$ e $1\,^{1}/_{2}$ f $3\,^{3}/_{4}$
   g $1\,^{1}/_{8}$ h 10
6. a $7\,^{7}/_{8}$ b 33 c $36\,^{2}/_{3}$ kg
7. $2\,^{10}/_{27}$ cm^3
8. $3\,^{3}/_{4}$ cm^2

Coordinates

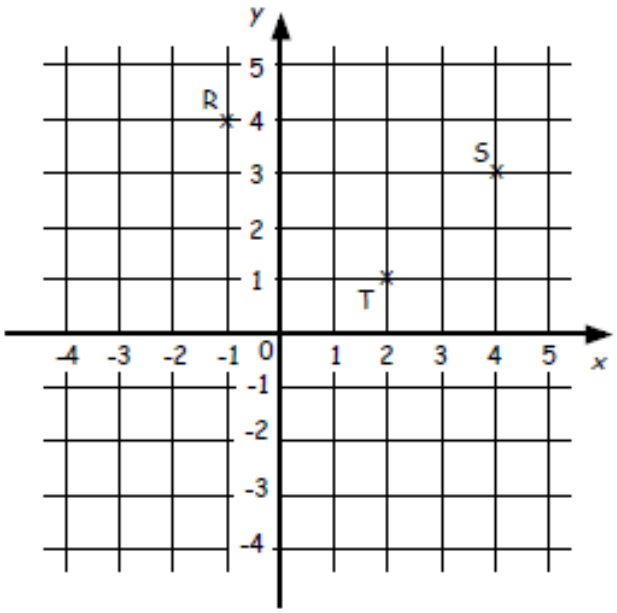
Exercise 1 — Coordinates in 4 quadrants

1. Write down the coordinates of :-
   - **a** each point shown in the diagram.
   - **b** the point on the *y* axis.
   - **c** all the points with the same *x* coordinate.
   - **d** all the points with the same *y* coordinate.
   - **e** the point with the same *x* and *y* coordinates.
   - **f** the fourth vertex, P of the rectangle DABP.



2. **a** Copy the same axes grid from question 1.
   - **b** Plot the points P(2, 3), Q(4, 0), R(2, –3), S(–2, –3), T(–4, 0).
   - **c** Plot the point U, where PQRSTU are the vertices of a hexagon.

3. Look at the diagram shown.
   - **a** Write down the coordinates of R, S and T.
   - **b** Reflect RST over the *x*-axis and write down the coordinates of R'S'T'.
   - **c** Reflect R'S'T' over the *y*-axis and write down the coordinates of R''S''T''.

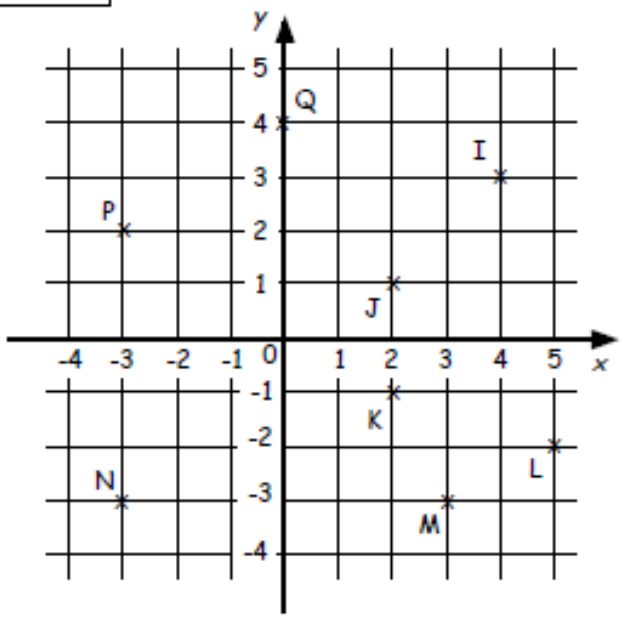


4. The vertices of a triangle reflected over the *y*-axis and then the *x*-axis are A''(1, 5), B''(7, 0) and C''(2, 2).

   State the coordinates of the original triangle ABC.

Coordinates

Revisit - Review - Revise Exercise 5



1. Write down all the coordinates :-
   - a shown on the diagram.
   - b that lie on either axes.
   - c that have the same x and y coordinate.

2. PJSN are the vertices of a parallelogram.

   State the coordinates of vertex S.

3.
   - a Copy the axes above.
   - b Plot the points R(1, 3), S(-4, 2), T(-3, -2) and U(2, -4).
   - c Draw a vertical line which cuts through (2,0).
   - d Reflect RSTU over the dotted line.

Answers

Exercise 1 – Coordinates in 4 Quadrants

1. a A(-3,4), B(2,4), C(4,-3), D(-3,-3), E(3,-1), F(0,-4), G(-2,0)
   b F c A & D d A&B, D&C
   e D f P(-2,-3)
2. a/b See diagram c U(-2,3)
3. a R(-1,4), S(4,3), T(2,1)
   b see diagram - R'(-1,-4), S'(4,-3), T'(2,-1)
   c see diagram - R''(1,-4), S''(-4,-3), T''(-2,-1)
4. A(-1,-5), B(-7,0), C(-2,-2)

Review – Revisit – Revise Exercise 5

1. a I(4,3), J(2,1), K(2,-1), L(5,-2), M(3,-3), N(-3,-3), P(-3,2), Q(0,4)
   b Q(0,4) c N(-3,-3)
2. a S(2,-4)
3. a/b/c See diagram
   d R'(3,3), S'(8,2), T'(7,-2), U'(2,-4)

Percentages

Exercise 1 Percentages - no calculator

1. Find each of the following **without** a calculator :-

a	10% of £24	b	30% of £420	c	20% of $55	d	$33\frac{1}{3}$% of 690 kg
e	25% of £32	f	75% of 50 m	g	$66\frac{2}{3}$% of 39 km	h	5% of $600
i	3% of £7	j	22% of 7000	k	2·5% of 160 cm	l	35% of €700

2. a A shop is giving a 20% discount on a £240 exercise bike.

   How much is the bike now ?

   b Julian cycles 30 km **per day** every day. He is going to reduce this by 15%.

   How many km will he cycle next **week** ?

3. A bank pays an annual rate of 5% interest on their High Fliers account. Gaz leaves £4800 in his account for a year.

   How much interest will he have after :-

   a one year b six months c three months ?

4. Five hundred students were asked their favourite take away.

   40% - Pizza 35% - Chinese 20% - Indian the rest - Chip shop

   How many students chose :- a Chinese b Chip shop ?

Exercise 2 Percentages with a calculator

1. Find using a calculator :- (Show all your working)

a	23% of 136 km	b	76% of 78 kg	c	19% of 320 m
d	38·5% of £700	e	0·6% of $1260	f	12·5% of €40
g	9% of £340	h	111% of 750 km	i	3·7% of £10.

Percentages

2. a A farmer has 3200 chickens. 32% have caught a virus.

   (i) What percentage of chickens do NOT have a virus ?

   (ii) How many chickens do NOT have a virus ?

   b Ninety percent of the chickens produce an egg every **day**.

   How many eggs are produced every **week** ?

   c 2·5% of the weekly produce has to be destroyed.

   How many eggs are destroyed ?

3. 

Last November, Norma weighed 64 kg.
After Xmas, her weight had increased by 9%.

What was her weight after Xmas ?

4. Twins Joe and Jack are sales directors who earn £28 000 each.

   - Joe is given a wage rise of 7·5%.
   - Jack has his wage reduced by 4%.

   How much **more** does Joe now earn than Jack ?

Exercise 3 — Linking fractions, decimals & percentages

1. Change each of these fractions to percentages, correct to 1 decimal place :-

   a $\frac{2}{3}$ b $\frac{1}{7}$ c $\frac{71}{90}$ d $\frac{142}{80}$.

2. Heather scored the following in four tests :-

   Maths - $\frac{17}{20}$ *English* - $\frac{26}{32}$

   French - $\frac{33}{45}$ *Music* - $\frac{7}{10}$

   a Change each test mark into a percentage.

   b Which was her best score ?

3. Re-write the following in order, smallest first :-

   a 0·5, 47%, $\frac{24}{50}$, 0·49 b 45% of £72, $\frac{2}{3}$ of £48, 0·04 x £804.

Percentages

Revisit - Review - Revise Exercise 6a

1. Change each of the following into a fraction in its simplest form :-

   a 50% b 25% c 75% d 33·333....%

   e 60% f 70% g 5% h 77%.

2. Change each of the following to a percentage :-

   a 0·43 b 0·09 c 0·3 d 0·225

   e $\frac{2}{3}$ f $\frac{4}{5}$ g 1·25 h $1\frac{1}{2}$.

3. a David gets a 10% **increase** on his £1640 monthly wage.
   How much does he now earn ?

   b Angela has her £640 weekly wage **decreased** by 15%.
   How much is her weekly wage now ?

Revisit - Review - Revise Exercise 6b

1. Find using a calculator :- (Show all your working)

   a 27% of 2300 km b 57% of 18 kg c 13% of 608 m

   d 27·5% of £1100 e 0·3% of $4500 f 105% of €400

   g 0·75 x £340 h 0·1 x 550 kg i 0·005 x 8600

   j $\frac{2}{3}$ of $810 k $\frac{4}{5}$ of 8855 m l $\frac{12}{13}$ of 520 km.

2. Keith earns £18 400 per annum as a plumber.
   How much would he earn if his salary was :-

   a increased by 17% b decreased by 9·5% ?

3. 

   SpotsAlive buy football strips for £25.
   They intend to sell them at a profit of 28%.
   How much should they sell each strip for ?

4. A car costs £8600 cash.
   VirgoCars let you pay a 16% deposit and
   36 monthly payments of £224·35.
   How much cheaper is it to pay cash ?

Answers

Exercise 1 - Percentages - No Calculator

1. a £2·40 b £126 c $11 c 230 kg
   d £8 e 37·5 m g 26 km h $30
   i 21p j 1540 k 4 cm l €245
2. a £192 b 178·5 km
3. a £240 b £120 c £60
4. a 175 b 25

Exercise 2 - Percentages with a Calculator

1. a 31·28 km b 59·28 kg c 60·8 m
   d £269·50 e $7·56 f €5
   g £30·60 h 832·5 km i 37p
2. a (i) 68% (ii) 2176 b 20160 c 504
3. 69·76 kg 4. £3220

Exercise 3 - Linking Fractions, Decimals % %ages

1. a 66·7% b 14·3% c 78·9% d 177·5%
2. a Maths - 85%, English - 81·25%,
   French - 73·3%, Music - 70%
   b Maths (obviously)
3. a 47% - $^{24}/_{50}$ - 0·49 - 0·5
   b $^{2}/_{3}$ of £48 - 0·04 x £804 - 45% of £72

Review - Revisit - Revise Exercise 6a

1. a $^{1}/_{2}$ b $^{1}/_{4}$ c $^{3}/_{4}$ d $^{1}/_{3}$
   e $^{3}/_{5}$ f $^{7}/_{10}$ g $^{1}/_{20}$ h $^{77}/_{100}$
2. a 43% b 9% c 30% d 22·5%
   e 66·66..% f 80% g 125% h 150%
3. a £1804 b £544

Review - Revisit - Revise Exercise 6b

1. a £621 b 10·26 kg c 79·04 m
   d £302·50 e $13·50 f €420
   g £255 h 55 kg i 43
   j $540 k 7084 m l 480 km
2. a £21528 b £16652
3. £32
4. £852·60

Algebra

Exercise 2

1. Multiply out the brackets :-

a	$2(a+5)$	b	$3(x+2)$	c	$6(g+1)$	d	$7(m+4)$
e	$2(x-3)$	f	$5(n-2)$	g	$8(p-1)$	h	$10(t-4)$
i	$5(m-4)$	j	$2(1-u)$	k	$7(2-x)$	l	$15(2+k)$
m	$4(a+b)$	n	$2(c+d)$	o	$5(m-n)$	p	$10(d-e)$
q	$20(3+x)$	r	$30(4-w)$	s	$100(a-3)$	t	$50(g-6)$.

2. Remove the brackets :-

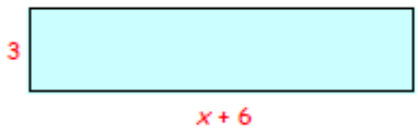
a	$2(3x+1)$	b	$2(4a+3)$	c	$3(1+5d)$	d	$4(3-5k)$
e	$7(7h-2)$	f	$8(5-4n)$	g	$6(5a+y)$	h	$2(6t+2z)$
i	$2(5b-4c)$	j	$7(10k-2p)$	k	$x(y+2)$	l	$a(b-8)$
m	$v(w-1)$	n	$a(a-3)$	o	$p(1-p)$	p	$x(2+x)$
q	$p(3q+r)$	r	$5a(2-4a)$	s	$2u(10u-y)$	t	$2(3a+2b+1)$
u	$5(2v+6w+8y)$	v	$3(5x-2y-4z)$	w	$10(p+q-4r)$	x	$8(3u-5v-9)$.

3. Rewrite the following without brackets :-

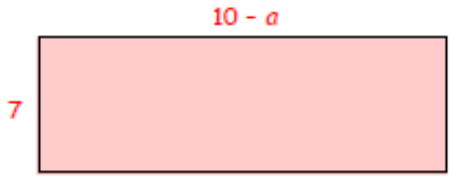
a	$-3(x+1)$	b	$-2(a-5)$	c	$-(m+n)$	d	$-(m-n)$
e	$-6(p-q)$	f	$-x(x+7)$	g	$-p(1+p)$	h	$-2w(w+9)$
i	$-k(7k-1)$	j	$-4e(2e+10)$	k	$-x(3y-8x)$	l	$-p^2(p-10q)$.

4. Write the areas of these two rectangles :- (*All units are in centimetres*). (i) with brackets (ii) without brackets.

a



b



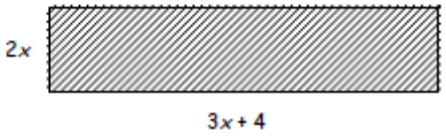
Algebra

Exercise 2 Breaking Brackets

1. Multiply out each bracket :-

a	$3(x+4)$	b	$7(y-3)$	c	$5(2k+5)$	d	$11(6y-7)$
e	$y(y+2)$	f	$k(k-3)$	g	$u(3u+4)$	h	$3r(3r-4)$
i	$-3(q+5)$	j	$-4(2t+6)$	k	$-5(j-2)$	l	$-2(3f-8)$
m	$-y(y+7)$	n	$-h(h-3)$	o	$-2w(2w+1)$	p	$-5k(3-4k)$.

2. Write down the **area** and **perimeter** of this rectangle :-
   a using brackets
   b without brackets.

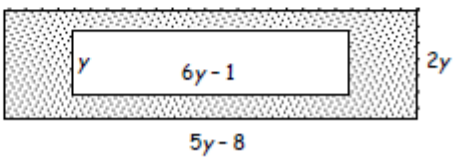


Exercise 3 Breaking Brackets and Simplifying

1. Multiply out the brackets and simplify fully where necessary :-

a	$5(k+2)+3$	b	$8(2y+4)-12$	c	$7(3e-2)+11$
d	$8+2(t+3)$	e	$11-3(3+w)$	f	$15-(g+15)$
g	$3(w-1)+2(w+1)$	h	$4(2y-3)+5(4y+3)$	i	$2(4r+3)-6$
j	$3w-(w+4)+2(2-w)$	k	$4(3y+4)-2(5y-1)-18$		
l	$3p+2(4p-6)-(9p+12)$	m	$5(3-2m)+3(2m-6)-4(1-8m)+2m+7$.		

2. Calculate the shaded area of the rectangle shown, in terms of y.



Solutions

Exercise 2 - Breaking Brackets

1. a $3x + 12$ b $7y - 21$
   c $10k + 25$ d $66y - 77$
   e $y^2 + 2y$ f $k^2 - 3k$
   g $3u^2 + 12u$ h $9r^2 - 12r$
   i $-3q - 15$ j $-8t - 24$
   k $-5j + 10$ l $-6f + 16$
   m $-y^2 - 7y$ n $-h^2 + 3h$
   o $-4w^2 - 2w$ p $-15k + 20k^2$

2. a $A = 2x(3x + 4)$ b $A = 6x^2 + 8x$

Exercise 3 - Breaking Brackets & Simplifying

1. a $5k + 13$ b $16y + 20$ c $21e - 3$
   d $2t + 14$ e $2 - 3w$ f $-g$
   g $5w - 1$ h $28y + 3$ i $8r$
   j 0 k $2y$
   l $2p - 24$ m $30m$
2. $A = 2y(5y - 8) - y(6y - 1) = 10y^2 - 16y - 6y^2 + y$
   $A = 4y^2 - 15y$

Equations

Exercise 1 — Solving Equations

1. Copy each equation and solve to find the value of x :-

a $x + 6 = 11$	b $x + 1 = 23$	c $x + 7 = 6$
d $x + 14 = 14$	e $x - 7 = 8$	f $x - 3 = 2$
g $13 + x = 17$	h $9 + x = 7$	i $17 - x = -17$.

2. Copy each equation and solve to find the value of the letter :-

a $4x = 12$	b $5p = 35$	c $6k = 24$
d $3h = 33$	e $4g = 56$	f $7n = 0$
g $4m = 144$	h $6c = 9$	i $8d = 1$.

3. Find the value of x in the following equations (*Set down ALL your working*).

a $2x + 6 = 14$	b $5x + 4 = 29$	c $4x + 7 = 39$
d $3x + 1 = 31$	e $4x - 8 = 16$	f $7x - 11 = 3$
g $10x - 9 = 41$	h $3x - 6 = 0$	i $11x - 7 = 37$
j $6x - 3 = 12$	k $8x + 12 = 15$	l $9x + 1 = 43$.

Exercise 2 — Harder Equations

1. Copy and complete :-

*(You may have been shown a different method)

a

$$8x + 1 = 6x + 17$$
$$\Rightarrow 2x + 1 = \ldots.$$
$$\Rightarrow 2x = \ldots.$$
$$\Rightarrow x = \ldots.$$

b

$$7x - 3 = x + 15$$
$$\Rightarrow 7x - \ldots = \ldots.$$
$$\Rightarrow 7x = \ldots.$$
$$\Rightarrow x = \ldots.$$

2. Solve these equations :-

a $5x + 4 = 2x + 19$	b $3x + 7 = x + 11$	c $8x + 6 = 7x + 22$
d $4x - 5 = x + 16$	e $11x - 1 = 2x + 17$	f $6x - 4 = 4x + 23$.

3. These equations are a little "different". Solve :-

a $5x = 4x + 3$	b $3x = x + 44$	c $7x = 4x + 42$
d $12x = 8x + 1$	e $15x = 3x + 18$	f $6x - 2 = 8x$.

4. Joe bought 5 bags of marbles. Harry bought 3 bags, but he already had 20 loose marbles. They then had exactly the same number of marbles.

a Make up an equation to show this information.

b Solve the equation to determine how many marbles there are in a bag.

Equations

Exercise 3 Solving Equations with Brackets

1. Solve these equations by multiplying out the brackets first :-

   a $3(x+4)=21$ b $5(x+2)=80$ c $4(x-3)=28$

   d $9(x+2)=63$ e $8(x+7)=72$ f $3(x+3)=0$.

2. Solve these equations :-

   a $2(4x+2)=20$ b $3(2x-1)=21$ c $4(4x-5)=28$

   d $6(2x-1)=10x$ e $10(3x-3)=11x+8$ f $7(x+9)=6x$.

3. Solve :-

   a $2(x+4)-x-6=7$ b $3(x+1)+3x-8=13$

   c $4(x+2)-3x=14$ d $8(x-2)+2x+6=10$

   e $3(3x+2)+4(x-1)=6x+9$ f $2(5x-4)+6(x+1)=3x+24$

   g $3(x+7)-4(x+3)=10$ h $2(x-3)-3(x-4)=7$

   i $3(3x+1)-2(x-5)=x+37$ j $13(x+3)-2(3x+11)=2x+7$.

Exercise 4 Solving Equations with Fractions

1. Copy and complete the following equation :-

$$\tfrac{1}{2}x + 4 = 11$$

$$2 \times \tfrac{1}{2}x + 2 \times 4 = 2 \times 11$$

$$\Rightarrow \quad x + \ldots = \ldots$$

$$\Rightarrow \quad x = \ldots$$

2. Solve each of these equations, by first of all multiplying every term by the l.c.m. of all the fractional denominators. This should eliminate all the fractions.

   a $\frac{1}{2}x-2=5$ b $\frac{1}{3}x+1=11$ c $\frac{1}{4}x-5=3$

   d $\frac{3}{4}x-12=0$ e $2+\frac{1}{3}x=13$ f $\frac{3}{8}x+8=14$

   g $\frac{2}{3}x+5=15$ h $\frac{5}{6}x-8=12$ i $\frac{3}{6}x+\frac{1}{6}=\frac{4}{6}$

   j $\frac{2}{3}x+\frac{1}{2}=2\frac{1}{2}$ k $\frac{1}{2}x+\frac{1}{3}=\frac{2}{3}$ l $\frac{1}{4}x+\frac{2}{3}=\frac{5}{3}$

   m $\frac{1}{2}x-4=\frac{3}{4}$ n $\frac{2}{3}x-10=\frac{1}{3}$ o $\frac{1}{2}x+\frac{2}{3}=\frac{3}{4}$.

Answers

Ch 5 Ex 1 Solving Equations

1.	a	5	b	22	c	-1
	d	0	e	15	f	5
	g	4	h	-2	i	34
2.	a	3	b	7	c	4
	d	11	e	14	f	0
	g	36	h	$^3/_2$	i	$^1/_8$
3.	a	4	b	5	c	8
	d	10	e	6	f	2
	g	5	h	2	i	4
	j	$^{15}/_6 = 2{\cdot}5$	k	$^3/_8$		
	l	$^{42}/_9 = {}^{14}/_3 = 4\,{}^2/_3$				

Ch 5 Ex 2 Harder Equations

1.	a	8	b	3		
2.	a	5	b	2	c	16
	d	7	e	2	f	$^{27}/_2$
3.	a	3	b	22	c	14
	d	$^1/_4$	e	$^{18}/_{12} = 1{\cdot}5$	f	-1
4.	a	$5x = 3x + 20$			b	10

Ch 5 Ex 3 Solving Equations with Brackets

1.	a	3	b	14	c	10
	d	5	e	2	f	-3
2.	a	2	b	4	c	3
	d	3	e	2	f	-63
3.	a	5	b	3	c	6
	d	2	e	1	f	2
	g	-1	h	-1	i	4
	j	-2				

Ch 5 Ex 4 Solving Equations with Fractions

1.	14					
2.	a	14	b	30	c	32
	d	16	e	33	f	16
	g	15	h	24	i	1
	j	3	k	$^2/_3$	l	4
	m	$9^1/_2$	n	$15^1/_2$	o	$^1/_6$