

# S1 Block Test Two Revision Booklet MP2



# 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  $3\frac{1}{8}$

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  $7\frac{4}{5} - 5\frac{3}{8}$

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.

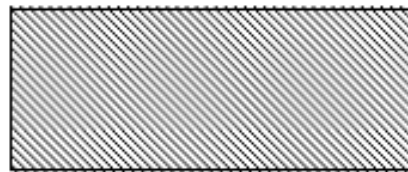
He only managed to run  $8\frac{5}{8}$  km.

How far short was he of completing his practice ?



6. a Calculate the perimeter of the rectangle shown.

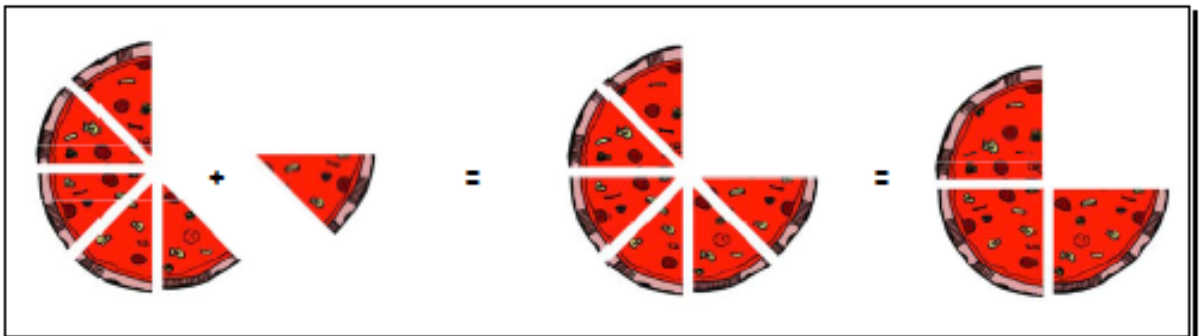
$5\frac{4}{5}$  cm



b How much longer is the length than the breadth ?

$8\frac{3}{4}$  cm

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



# Answers

## Exercise 1 - Revision

- 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  $22/24, 33/36$
- a  $1/2$       b  $2/3$       c  $6/7$       d  $2/3$   
d  $1/8$       f  $3/4$       g  $1/3$       h  $61/72$
- a  $124/240 = 31/60$       b  $160/1660 = 1/11$

## Exercise 2 - Top-Heavy and Mixed Fractions

- a  $1\frac{1}{2}$       b  $5\frac{1}{2}$       c  $5\frac{2}{3}$       d  $8\frac{1}{6}$   
e  $11\frac{1}{10}$       f  $8\frac{1}{9}$       g  $40\frac{4}{5}$       h  $13\frac{5}{12}$
- $5\frac{2}{3}$  kg
- a  $4\frac{1}{2}$       b  $5\frac{1}{2}$       c  $14\frac{1}{2}$       d  $8\frac{1}{2}$   
e  $30\frac{1}{2}$       f  $12\frac{3}{5}$       g  $55\frac{1}{2}$       h  $12\frac{1}{4}$
- a 11      b 23      c 27
- a  $19/6$       b  $19/3$       c  $5/3$       d  $69/6$   
e  $36/4$       f  $123/11$       g  $122/7$       h  $408/6$

## Exercise 3 - Add/Subtract Basic Fractions

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

## Exercise 4 - Add/Subtract Harder Fractions

- a  $3/4$       b  $7/12$       c  $17/20$       d  $1\frac{1}{24}$   
e  $5/12$       f  $5/24$       g  $18/35$       h  $122/45$   
i  $26/156$       j  $5/88$       k  $3/4$       l  $11/24$
- a  $1\frac{1}{2}$       b  $5\frac{13}{14}$       c  $5\frac{5}{12}$       d  $2\frac{1}{20}$   
e  $3\frac{5}{24}$       f  $3\frac{3}{4}$       g  $12\frac{9}{40}$       h  $13/18$

## Review - Revisit - Revise Exercise 9

- a  $2/6, 3/9$       b  $4/10, 6/15$   
c  $18/20, 27/30$       d  $22/34, 33/51$
- a  $11/2$       b  $14/3$       c  $68/7$       d  $20/11$
- a  $3\frac{2}{3}$       b  $2\frac{6}{7}$       c  $11\frac{2}{9}$       d  $7\frac{1}{2}$
- a  $7/10$       b  $2\frac{5}{6}$       c  $5\frac{11}{16}$       d  $7\frac{1}{2}$   
e  $2\frac{3}{14}$       f  $27/30$       g  $27/12$       h  $3\frac{14}{15}$   
i  $8\frac{13}{16}$       j  $20\frac{19}{36}$       k  $12\frac{3}{45}$       l  $1\frac{1}{9}$
- $17/8$  km
- a  $29\frac{1}{10}$  cm      b  $2\frac{19}{20}$  cm
- $5/8 + 1/8 = 6/8 = 3/4$

# More Fractions

## Exercise 1

### Multiplying Fractions



1. Copy the following and complete :-

$$\begin{aligned}\frac{2}{3} \times \frac{5}{6} \\ &= \frac{2 \times 5}{3 \times 6} \\ &= \frac{?}{18} = \frac{?}{?}.\end{aligned}$$

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  $\frac{6}{7} \times \frac{7}{9} \times \frac{3}{8}$

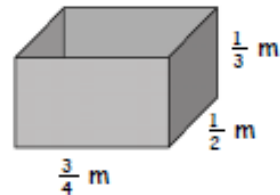
g  $\frac{3}{10} \times \frac{5}{6} \times \frac{2}{3}$

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  $6\frac{1}{3} \times \frac{15}{19}$ .



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 be 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  $\frac{3}{4} \div \frac{1}{4}$

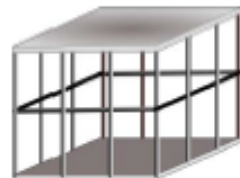
d  $10\frac{1}{2} \div 2\frac{1}{3}$ .

6. An empty metal cage weighs  $4\frac{3}{7}$  kg.

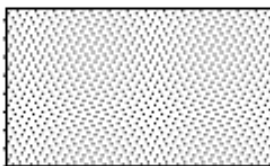
It holds 8 large watermelons.

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<sup>2</sup>.

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  $4^2/6$     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  $13/16$     h 2    i  $32/49$

j  $3/4$     k  $4/3$     l  $5/4$

2. a 6    b 10

3. a 3    b  $1^1/16$     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  $2^2/6$     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  $8^4/6$

c 3    d  $4^1/2$

6.  $19^2/21$

7.  $2^2/3$  cm

8.  $1/6$

## 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<sup>3</sup>

8.  $3^3/4$  cm<sup>2</sup>



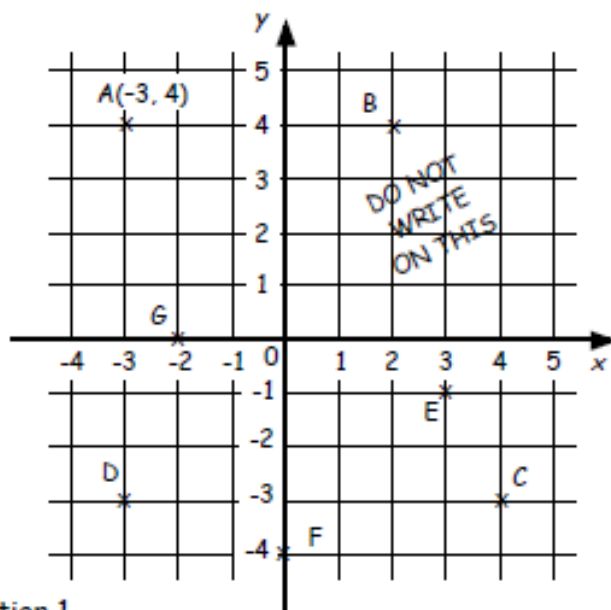
# Coordinates

## Exercise 1

### Coordinates in 4 quadrants

1. Write down the coordinates of :-

- each point shown in the diagram.
- the point on the  $y$  axis.
- all the points with the same  $x$  coordinate.
- all the points with the same  $y$  coordinate.
- the point with the same  $x$  and  $y$  coordinates.
- the fourth vertex,  $P$  of the rectangle  $DABP$ .

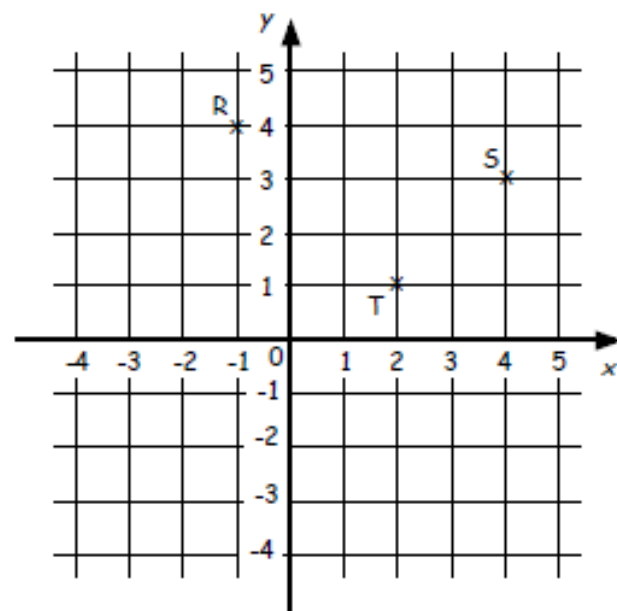


2. a Copy the same axes grid from question 1.

- Plot the points  $P(2, 3)$ ,  $Q(4, 0)$ ,  $R(2, -3)$ ,  $S(-2, -3)$ ,  $T(-4, 0)$ .
- Plot the point  $U$ , where  $PQRSTU$  are the vertices of a hexagon.

3. Look at the diagram shown.

- Write down the coordinates of  $R$ ,  $S$  and  $T$ .
- Reflect  $RST$  over the  $x$ -axis and write down the coordinates of  $R'S'T'$ .
- 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.

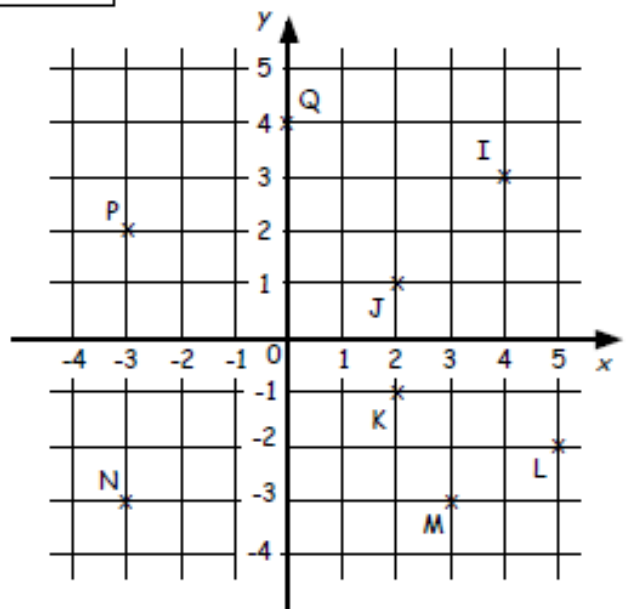
State the coordinates of vertex S.

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

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

## Review - Revisit - Revise Exercise 5

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

# 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.
- What percentage of chickens do NOT have a virus ?
  - 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 -  $\frac{7}{10}$

- Change each test mark into a percentage.
  - 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




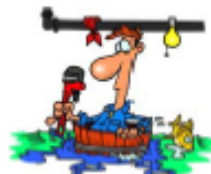
- Change each of the following into a fraction in its simplest form :-
  - 50%
  - 25%
  - 75%
  - 33.333...%
  - 60%
  - 70%
  - 5%
  - 77%
- Change each of the following to a percentage :-
  - 0.43
  - 0.09
  - 0.3
  - 0.225
  - $\frac{2}{3}$
  - $\frac{4}{5}$
  - 1.25
  - $1\frac{1}{2}$
- David gets a 10% **increase** on his £1640 monthly wage.  
How much does he now earn ?
  - Angela has her £640 weekly wage **decreased** by 15%.  
How much is her weekly wage now ?



## Revisit - Review - Revise Exercise 6b



- Find using a calculator :- (Show all your working)
  - 27% of 2300 km
  - 57% of 18 kg
  - 13% of 608 m
  - 27.5% of £1100
  - 0.3% of \$4500
  - 105% of €400
  - $0.75 \times \text{£}340$
  - $0.1 \times 550 \text{ kg}$
  - $0.005 \times 8600$
  - $\frac{2}{3}$  of \$810
  - $\frac{4}{5}$  of 8855 m
  - $\frac{12}{13}$  of 520 km.
- Keith earns £18 400 per annum as a plumber.  
How much would he earn if his salary was :-
  - increased by 17%
  - decreased by 9.5% ?
-  SpotsAlive buy football strips for £25.  
They intend to sell them at a profit of 28%.  
How much should they sell each strip for ?
- 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 2 - Percentages with a Calculator

- 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
- a (i) 68% (ii) 2176 b 20160 c 504
3. 69.76 kg 4. £3220

## Exercise 3 - Linking Fractions, Decimals % %ages

- a 66.7% b 14.3% c 78.9% d 177.5%
- a Maths - 85%, English - 81.25%,  
French - 73.3%, Music - 70%  
b Maths (obviously)
- a 47% -  $\frac{24}{50}$  - 0.49 - 0.5  
b  $\frac{2}{3}$  of £48 - 0.04 x £804 - 45% of £72

## Review - Revisit - Revise Exercise 6a

- a  $\frac{1}{2}$  b  $\frac{1}{4}$  c  $\frac{3}{4}$  d  $\frac{1}{3}$   
e  $\frac{3}{5}$  f  $\frac{7}{10}$  g  $\frac{1}{20}$  h  $\frac{77}{100}$
- a 43% b 9% c 30% d 22.5%  
e 66.66...% f 80% g 125% h 150%
- a £1804 b £544

## Review - Revisit - Revise Exercise 6b

- 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
- a £21528 b £16652
- £32
- £852.60

## Exercise 1 - Percentages - No Calculator

- a £2.40 b £126 c \$11 d 230 kg  
d £8 e 37.5 m g 26 km h \$30  
i 21p j 1540 k 4 cm l €245
- a £192 b 178.5 km
- a £240 b £120 c £60
- a 175 b 25

# 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 :-

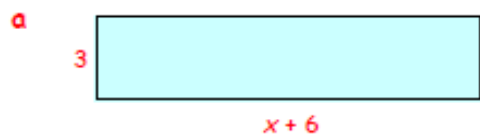
- |   |                   |   |                   |   |                  |   |                  |
|---|-------------------|---|-------------------|---|------------------|---|------------------|
| a | $2(3x + 1)$       | b | $2(4a + 3)$       | c | $3(1 + 5d)$      | d | $4(3 - 5k)$      |
| e | $7(7h - 2)$       | 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 | $8(3u - 5v - 9)$ |



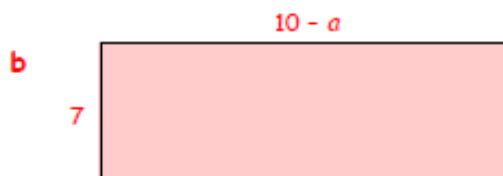
3. Rewrite the following without brackets :-

- |   |              |   |                |   |               |   |                 |
|---|--------------|---|----------------|---|---------------|---|-----------------|
| 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.





# Algebra

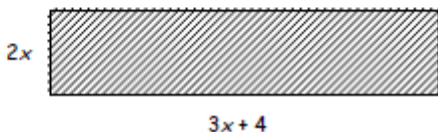
## Exercise 2 Breaking Brackets

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.

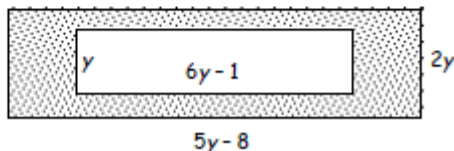


## Exercise 3 Breaking Brackets and Simplifying

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.  $A = 2\gamma(5y - 8) - \gamma(6y - 1) = 10y^2 - 16y - 6y^2 + y$   
 $A = 4y^2 - 15y$

# 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 :-

a

$$8x + 1 = 6x + 17$$

$$\Rightarrow 2x + 1 = \dots$$

$$\Rightarrow 2x = \dots$$

$$\Rightarrow x = \dots$$

b

$$7x - 3 = x + 15$$

$$\Rightarrow 7x - \dots = \dots$$

$$\Rightarrow 7x = \dots$$

$$\Rightarrow x = \dots$$

*\*(You may have been shown a different method)*

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  $13(x + 3) - 2(3x + 11) = 2x + 7.$

# 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  $\frac{3}{2}$            i  $\frac{1}{8}$
3. a 4            b 5            c 8  
   d 10           e 6            f 2  
   g 5            h 2            i 4  
   j  $\frac{16}{6} = 2.5$     k  $\frac{3}{8}$   
   l  $\frac{42}{9} = \frac{14}{3} = 4\frac{2}{3}$

## Ch 5 Ex 2 Harder Equations

1. a 8            b 3
2. a 5            b 2            c 16  
   d 7            e 2            f  $\frac{27}{2}$
3. a 3            b 22           c 14  
   d  $\frac{1}{4}$            e  $\frac{18}{12} = 1.5$    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