

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 $3\frac{1}{8}$

b $6\frac{1}{3}$

c $1\frac{2}{5}$

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.

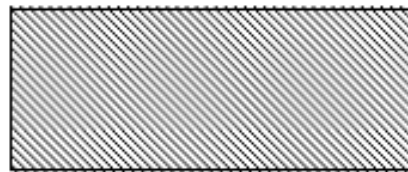
He only managed to run $8\frac{5}{8}$ km.

How far short was he of completing his practice ?



6. a Calculate the perimeter of the rectangle shown.

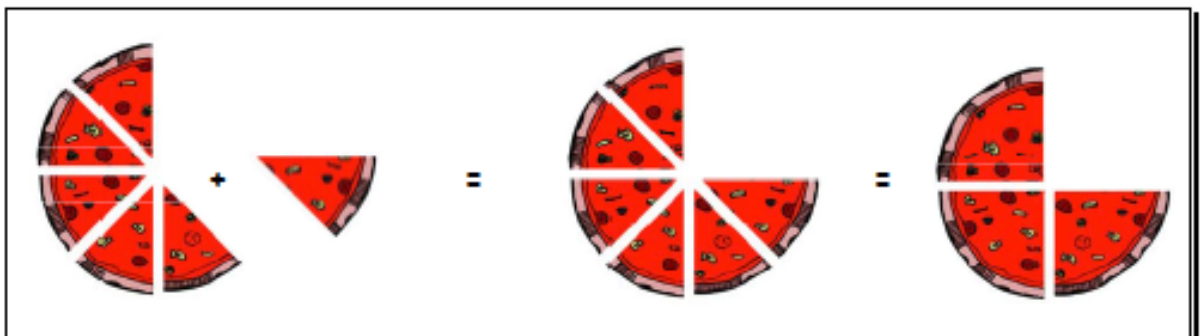
$5\frac{4}{5}$ cm



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

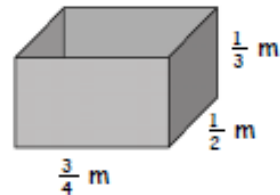
g $\frac{3}{10} \times \frac{5}{6} \times \frac{2}{3}$

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

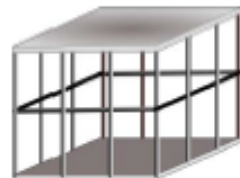
d $10\frac{1}{2} \div 2\frac{1}{3}$.

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

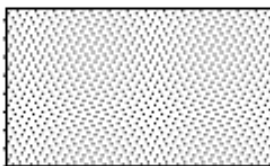
It holds 8 large watermelons.

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 $3\frac{1}{3}$ cm².

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. $2^{10}/27$ cm³

8. $3^3/4$ cm²

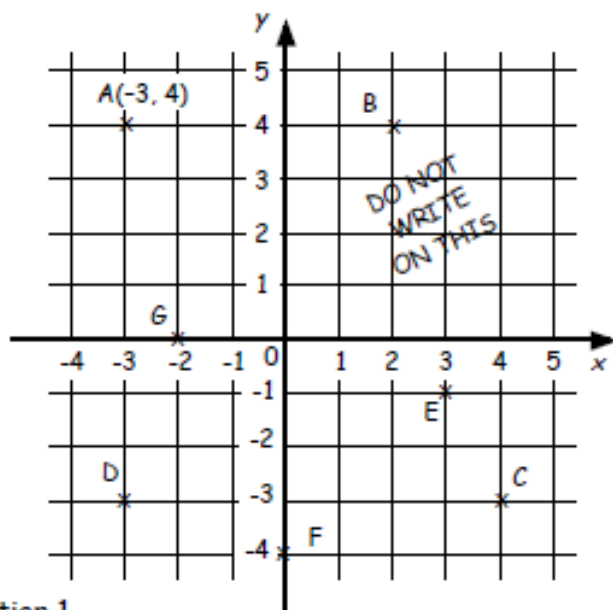
Coordinates

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 $DABP$.

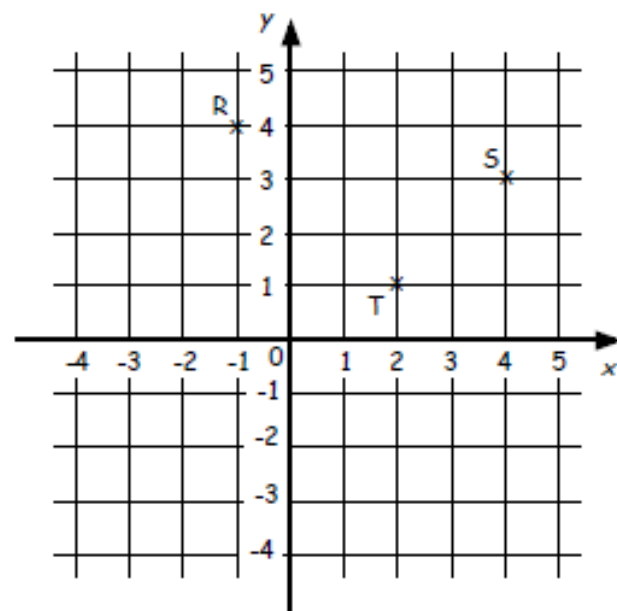


2. a Copy the same axes grid from question 1.

- 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 :-

- shown on the diagram.
- that lie on either axes.
- that have the same x and y coordinate.

2. PJSN are the vertices of a parallelogram.

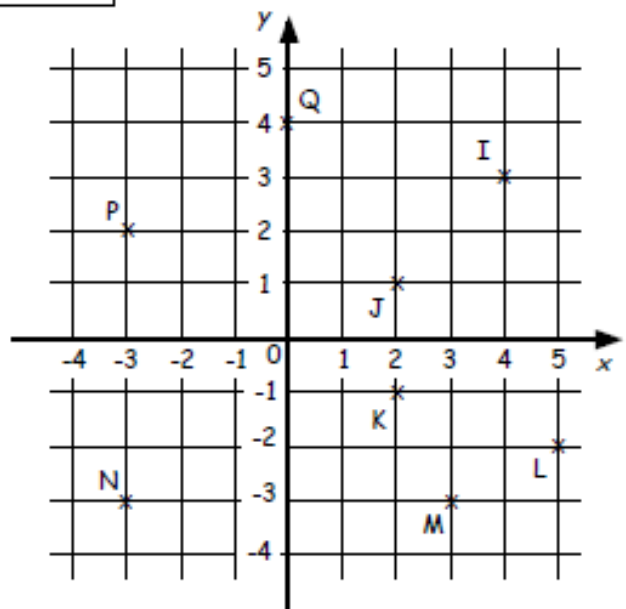
State the coordinates of vertex S.

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, $0.04 \times £804$.



Percentages

Revisit - Review - Revise Exercise 6a




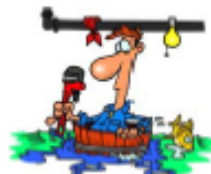
- Change each of the following into a fraction in its simplest form :-
 - 50%
 - 25%
 - 75%
 - 33.333...%
 - 60%
 - 70%
 - 5%
 - 77%
- Change each of the following to a percentage :-
 - 0.43
 - 0.09
 - 0.3
 - 0.225
 - $\frac{2}{3}$
 - $\frac{4}{5}$
 - 1.25
 - $1\frac{1}{2}$
- David gets a 10% **increase** 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
 - $0.75 \times \text{£}340$
 - $0.1 \times 550 \text{ kg}$
 - 0.005×8600
 - $\frac{2}{3}$ 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 :-

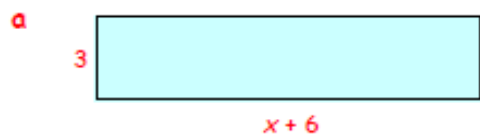
- | | | | | | | | |
|---|-------------------|---|-------------------|---|------------------|---|------------------|
| a | $2(3x + 1)$ | b | $2(4a + 3)$ | c | $3(1 + 5d)$ | d | $4(3 - 5k)$ |
| e | $7(7h - 2)$ | f | $8(5 - 4n)$ | g | $6(5a + y)$ | h | $2(6t + 2z)$ |
| i | $2(5b - 4c)$ | j | $7(10k - 2p)$ | 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 | $8(3u - 5v - 9)$ |



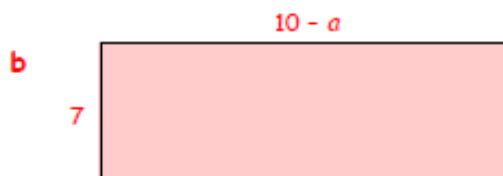
3. Rewrite the following without brackets :-

- | | | | | | | | |
|---|--------------|---|----------------|---|---------------|---|-----------------|
| 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

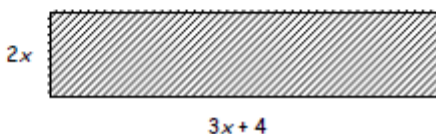
Exercise 2 Breaking Brackets

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.

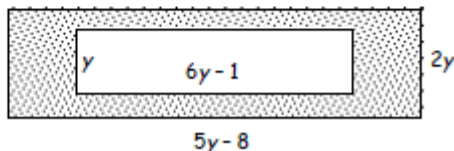


Exercise 3 Breaking Brackets and Simplifying

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



- Copy each equation and solve to find the value of x :-
 - $x + 6 = 11$
 - $x + 1 = 23$
 - $x + 7 = 6$
 - $x + 14 = 14$
 - $x - 7 = 8$
 - $x - 3 = 2$
 - $13 + x = 17$
 - $9 + x = 7$
 - $17 - x = -17$
- Copy each equation and solve to find the value of the letter :-
 - $4x = 12$
 - $5p = 35$
 - $6k = 24$
 - $3h = 33$
 - $4g = 56$
 - $7n = 0$
 - $4m = 144$
 - $6c = 9$
 - $8d = 1$
- Find the value of x in the following equations (*Set down ALL your working*).
 - $2x + 6 = 14$
 - $5x + 4 = 29$
 - $4x + 7 = 39$
 - $3x + 1 = 31$
 - $4x - 8 = 16$
 - $7x - 11 = 3$
 - $10x - 9 = 41$
 - $3x - 6 = 0$
 - $11x - 7 = 37$
 - $6x - 3 = 12$
 - $8x + 12 = 15$
 - $9x + 1 = 43$

Exercise 2

Harder Equations



- Copy and complete :-
 - $8x + 1 = 6x + 17$
 $\Rightarrow 2x + 1 = \dots$
 $\Rightarrow 2x = \dots$
 $\Rightarrow x = \dots$
 - $7x - 3 = x + 15$
 $\Rightarrow 7x - \dots = \dots$
 $\Rightarrow 7x = \dots$
 $\Rightarrow x = \dots$

**(You may have been shown a different method)*
- Solve these equations :-
 - $5x + 4 = 2x + 19$
 - $3x + 7 = x + 11$
 - $8x + 6 = 7x + 22$
 - $4x - 5 = x + 16$
 - $11x - 1 = 2x + 17$
 - $6x - 4 = 4x + 23$
- These equations are a little "different". Solve :-
 - $5x = 4x + 3$
 - $3x = x + 44$
 - $7x = 4x + 42$
 - $12x = 8x + 1$
 - $15x = 3x + 18$
 - $6x - 2 = 8x$
- 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.
 - Make up an equation to show this information.
 - 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 :-

$$\begin{aligned}\frac{1}{2}x + 4 &= 11 \\ 2 \times \frac{1}{2}x + 2 \times 4 &= 2 \times 11 \\ \Rightarrow x + \dots &= \dots \\ \Rightarrow x &= \dots\end{aligned}$$

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 $\frac{3}{2}$ i $\frac{1}{8}$
3. a 4 b 5 c 8
 d 10 e 6 f 2
 g 5 h 2 i 4
 j $\frac{16}{6} = 2\frac{5}{3}$ 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 $\frac{18}{12} = 1\frac{5}{4}$ 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 $\frac{2}{3}$ l 4
 m $9\frac{1}{2}$ n $15\frac{1}{2}$ o $\frac{1}{6}$