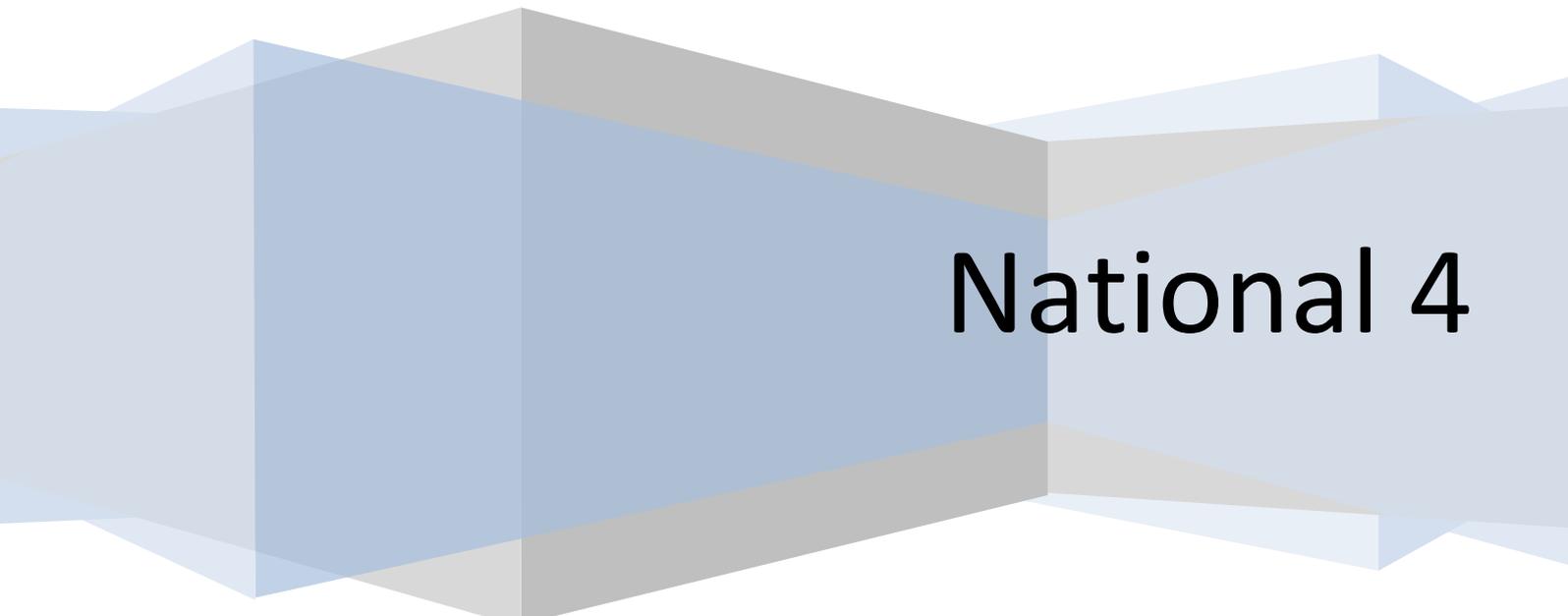Dumfries and Galloway Council

Relationships Revision

Mathematics

Suzanne Stoppard

National 4

Self Assessment Summary- 1.1 Applying algebraic skills to linear equations

| Assessment standard	Traffic Lights			Pupils Signature	Parents Signature
Drawing and recognising a graph of a linear equation					
Drawing and recognising a graph of a linear equation					
Solving linear equations.					
Changing the subject of a formula.					

1.1   Applying algebraic skills to linear equations

Drawing and recognising a graph of a linear equation.

1) a) Complete the table below for $y = 7 - 2x$.

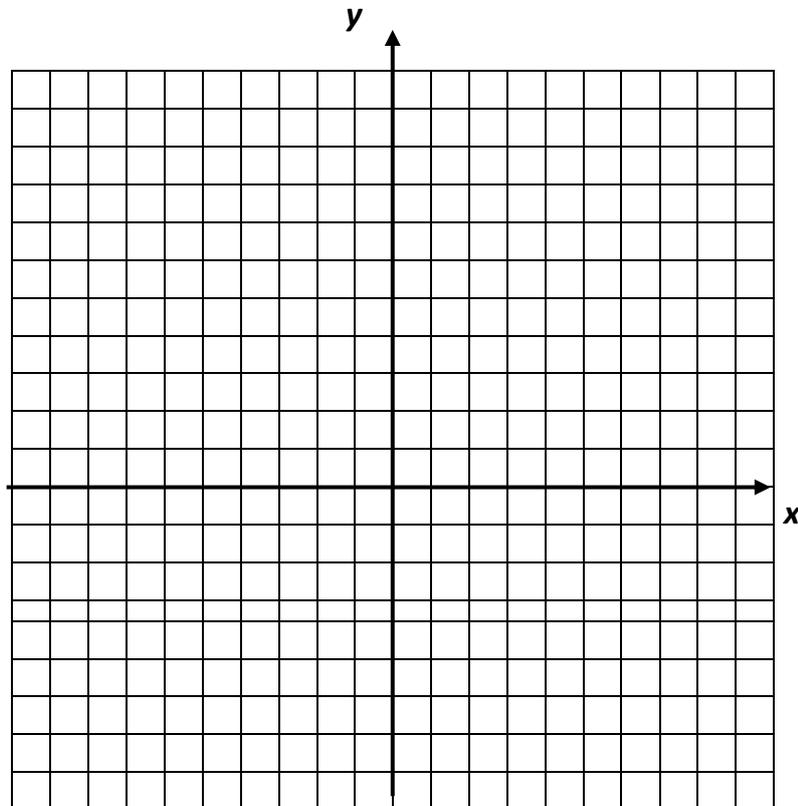| x	-1	3	5
y			

b) Using the table above, draw the graph of the line $y = 7 - 2x$ on the grid below
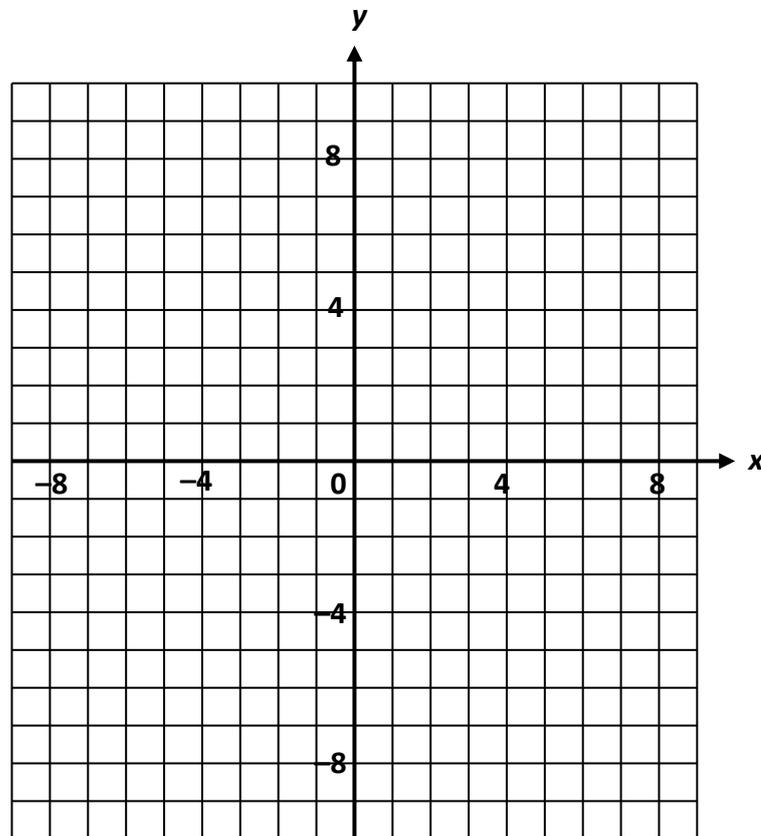
2) a) Complete this table of values for $y = 3x - 2$
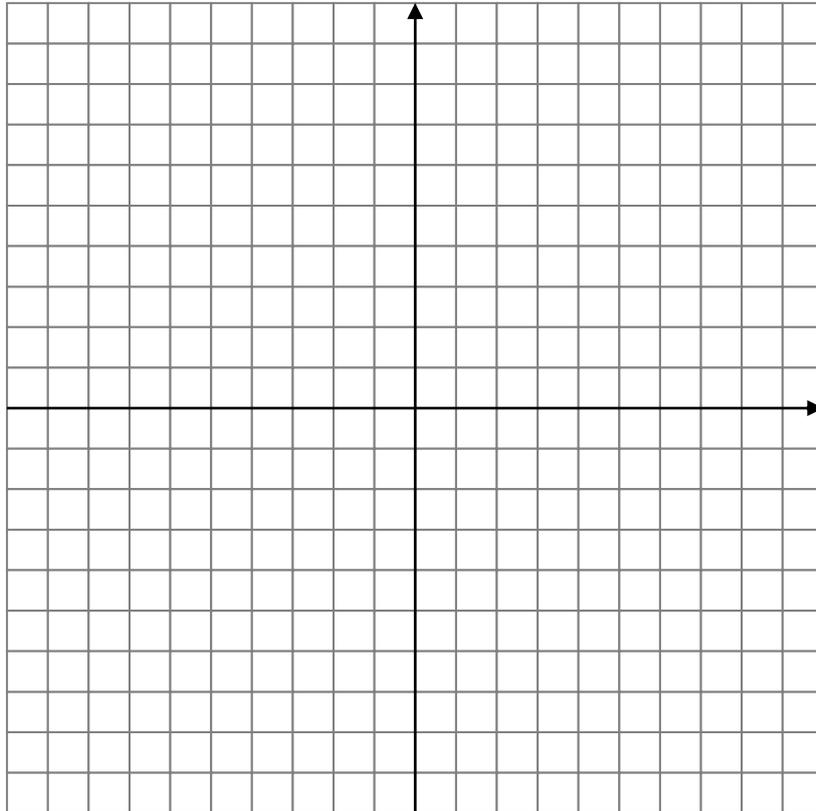
x	−2	1	4
y			

b) Draw the graph of $y = 3x - 2$ on the grid below.

3) a) Complete the table below for $y = 4 - x$.

x	-1	0	2	3
y				

b) Draw the line $y = 4 - x$ on the grid.

4) a) Complete the table below for $y = 3x - 1$.

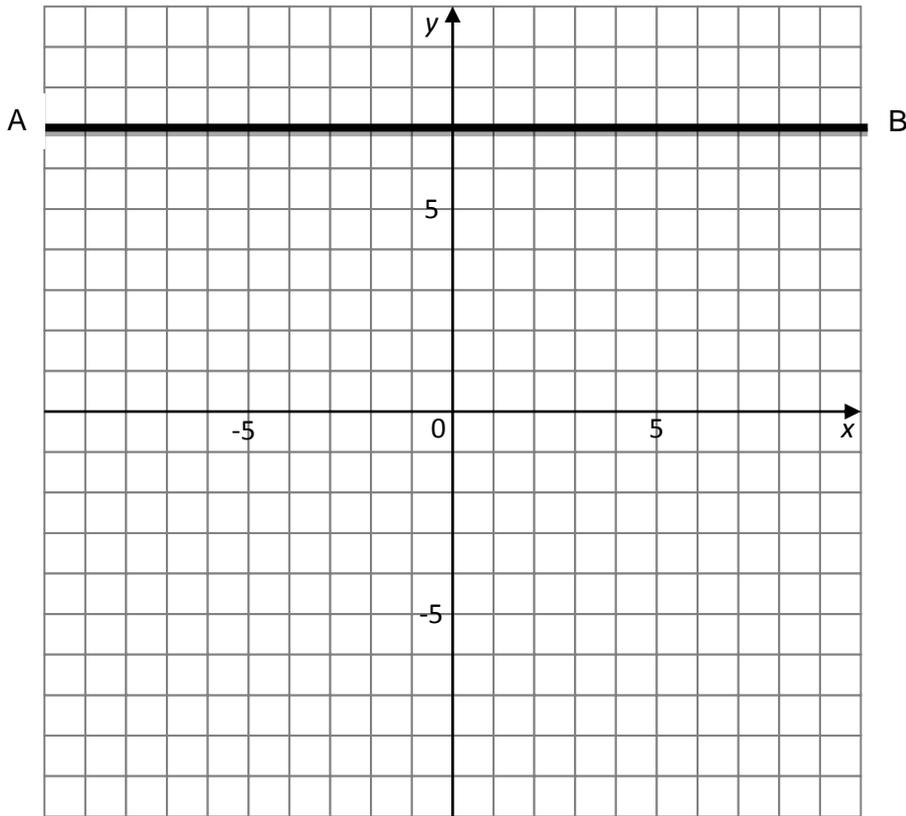| x	-1	0	2	3
y				

b) Draw the line $y = 3x - 1$ on the grid.
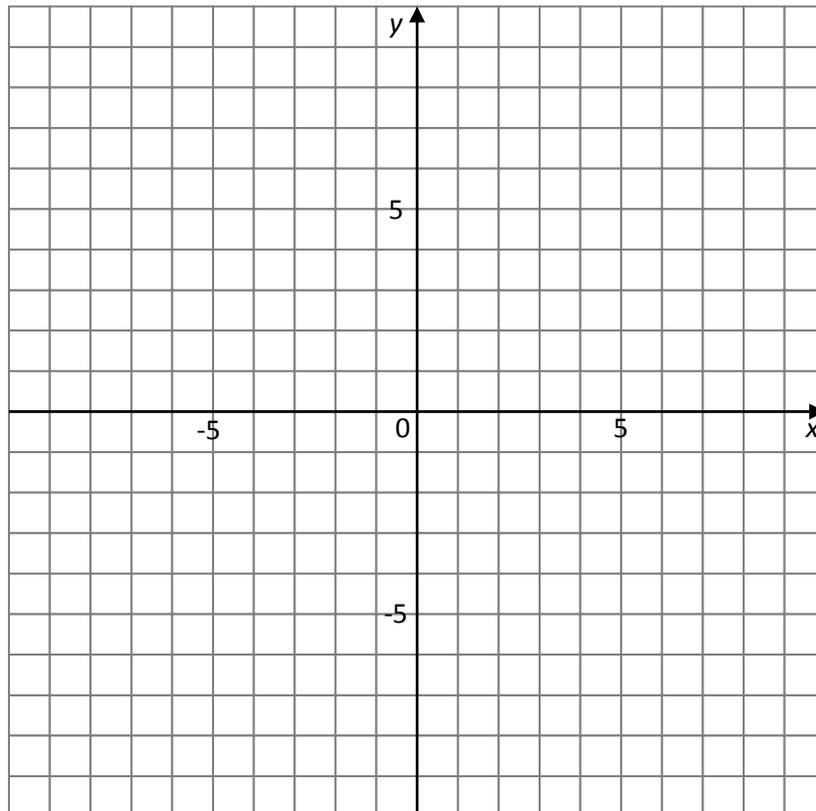
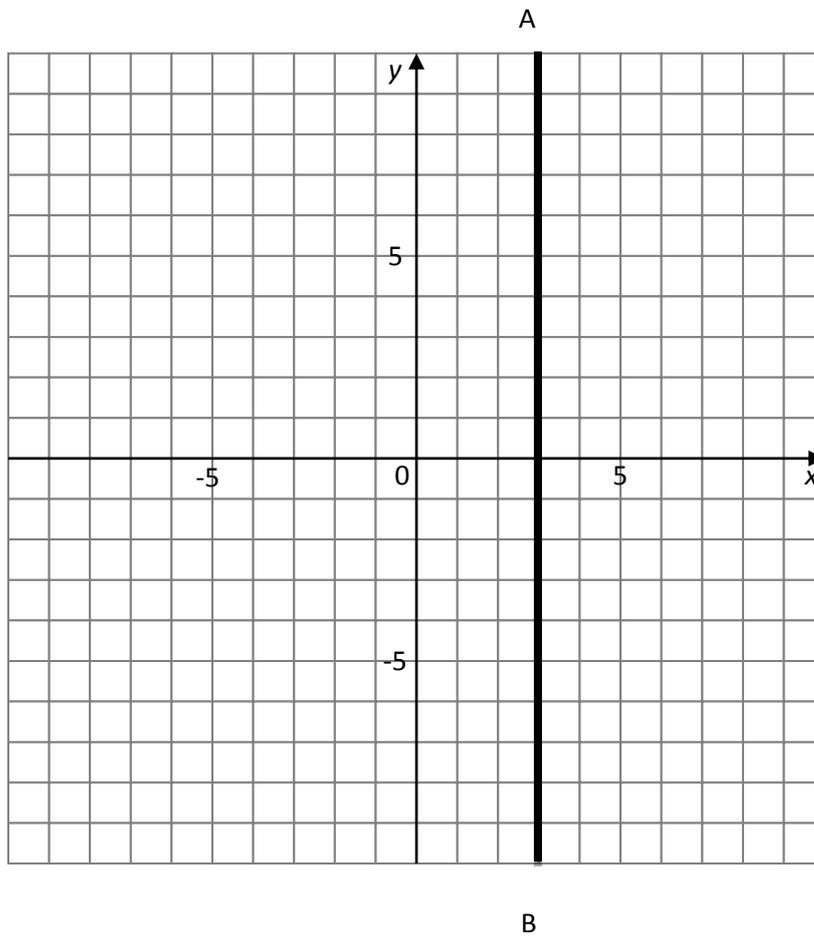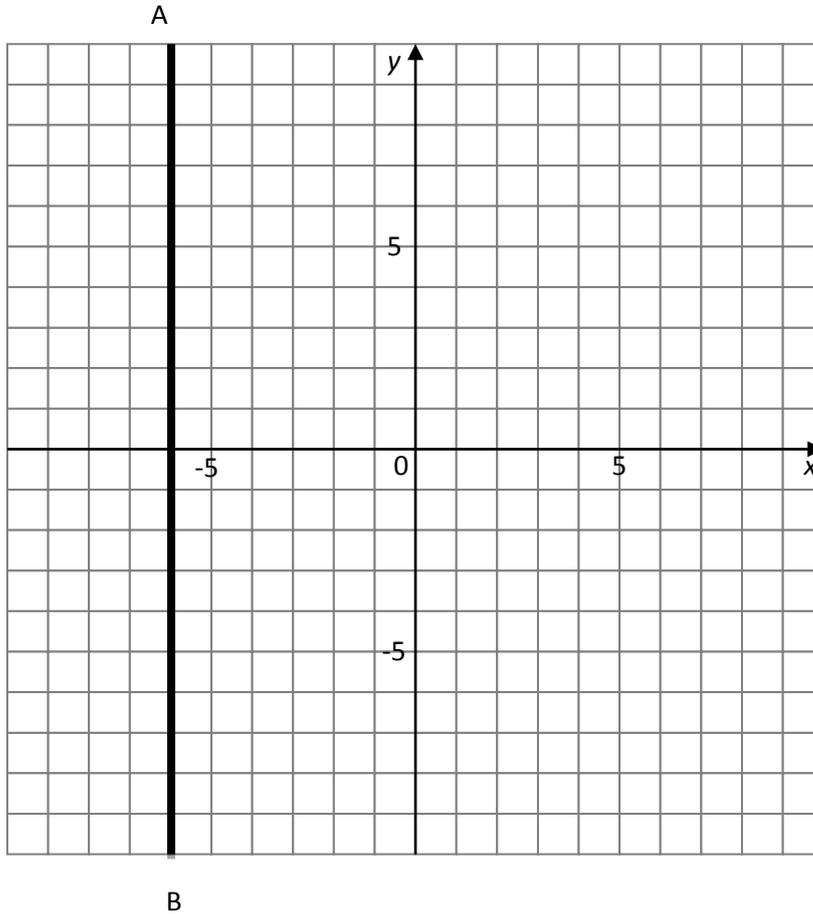## Drawing and recognising a graph of a linear equation

1) Line AB is shown on the grid below.

Write down the equation of line AB.

2) Line AB is shown on the grid below.

Write down the equation of line AB.
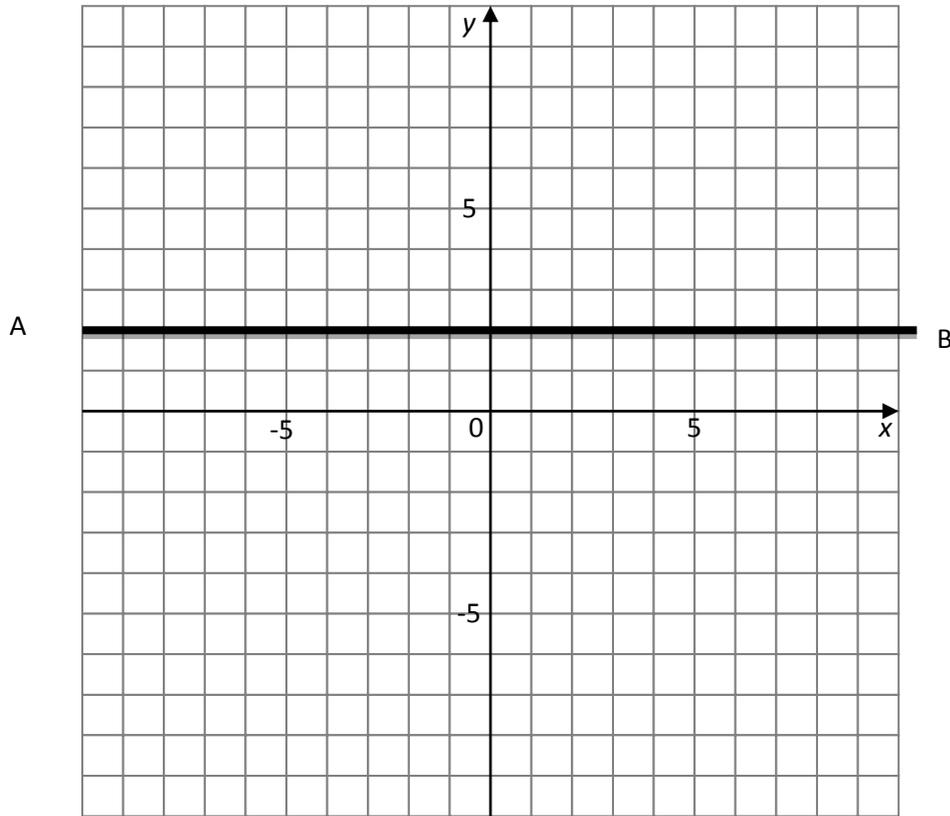
A

B

3)   Line AB is shown on the grid below.

Write down the equation of line AB.

A

B

4) Line AB is shown on the grid below.

Write down the equation of line AB.

Solving linear equations.

1) Solve the following equation:
   a) 5x+1=36   b) 3y+5=11   c) 4r+10=14   d) 6f-1=47

Changing the subject of a formula.

1) The distance formula is D=ST
   Change the subject to S

2) Force can be calculated by the formula: F=ma
   Change the subject to a.
3) Area of a rectangle is found by A=lb
   Change the subject to b
4) The circumference of a circle is found by C=∏D
   Change the subject to D

5) Change the subject of the formula:
   b=3c+4
   to c.
6) Change the subject of the formula:
   f=6d-9
   to d
7) Change the subject of the formula:
   y=3x-2
   to x
8) Change the subject of the formula:
   r=4s+4
   to s

## Self Assessment Summary- 1.2 Applying geometric skills to sides and angles of shapes

Assessment standard	Traffic Lights			Pupils Signature	Parents
	🟩	🟨	🟥		
Using Pythagoras' theorem.					
Using a fractional scale factor to enlarge or reduce a shape.					
Using parallel lines, symmetry and circle properties to calculate angles.					
Using Pythagoras' theorem (2)					

1.2 Applying geometric skills to sides and angles of shapes

Using Pythagoras' theorem.

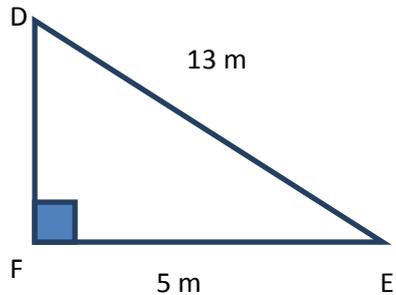1) Triangle ABC is a right-angled triangle as shown in the diagram below.

AB is 5 metres long and BC is 3 metres long.

A

5m

C

3m

B
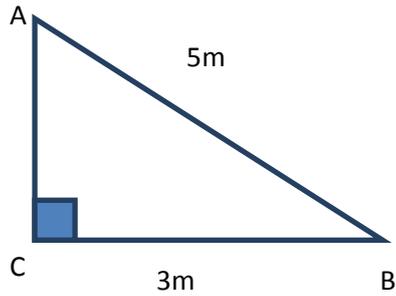
Calculate the length of AC (in metres).

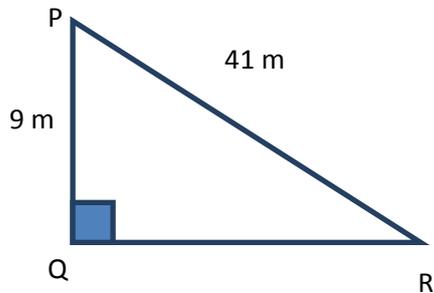2)   Triangle DEF is a right-angled triangle as shown in the diagram below.

DE is 13 metres long and FE is 5 metres long.

D

13 m

F

5 m

E

Calculate the length of DF (in metres).

3) Triangle PQR is a right-angled triangle as shown in the diagram below.
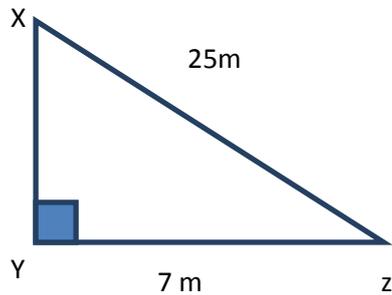
PR is 41 metres long and PQ is 9 metres long.

P

41 m

9 m

Q

R

Calculate the length of QR (in metres).

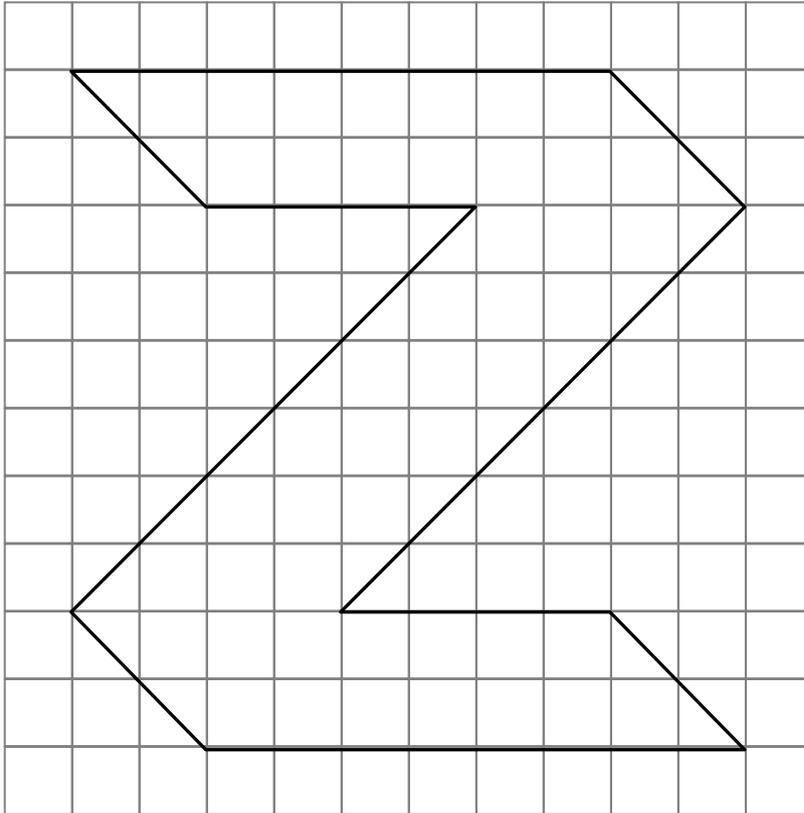4) Triangle XYZ is a right-angled triangle as shown in the diagram below.
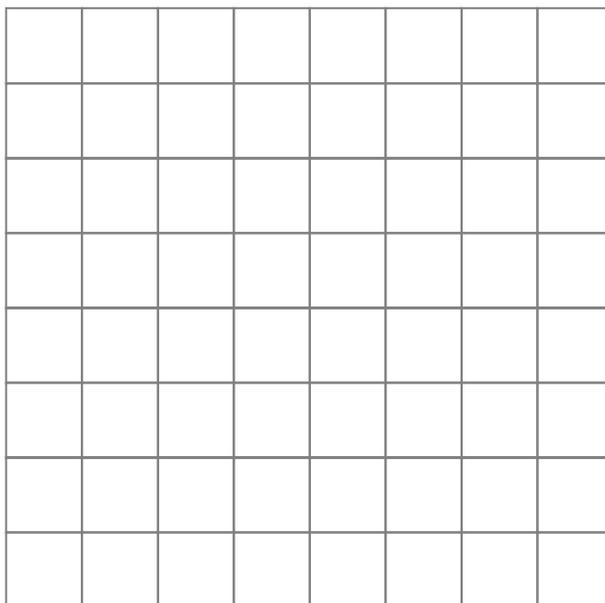
XY is 7 metres long and XZ is 25 metres long.

X

25m

Y

7 m

z

Calculate the length of XY (in metres).

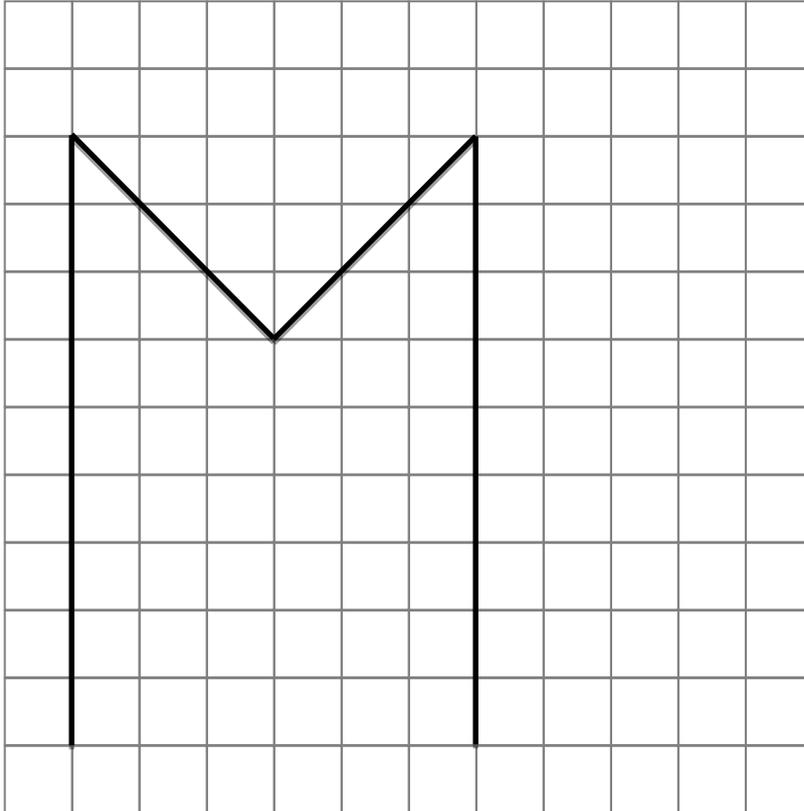**Using a fractional scale factor to enlarge or reduce a shape.**

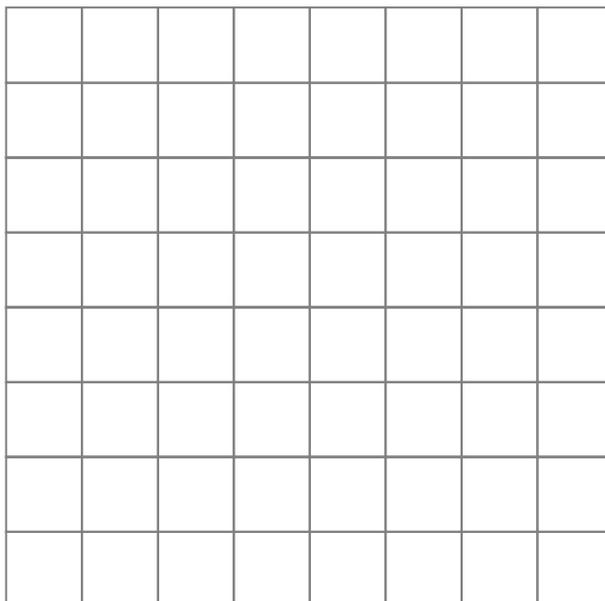1) The letter Z is shown in the diagram.

Using the grid below, draw a reduction of this letter Z using a scale factor of $\frac{1}{2}$.
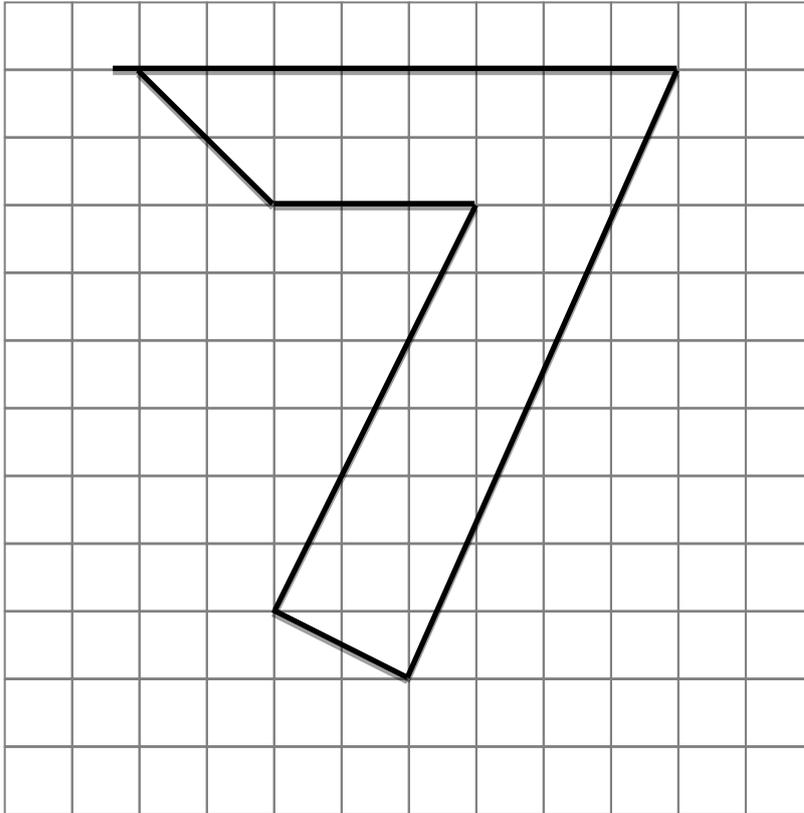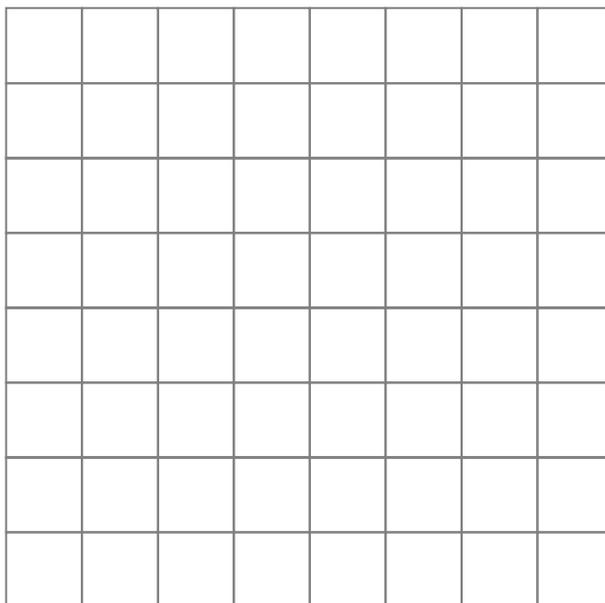
2) The letter Z is shown in the diagram.

Using the grid below, draw a reduction of this letter M using a scale factor of $\frac{1}{3}$
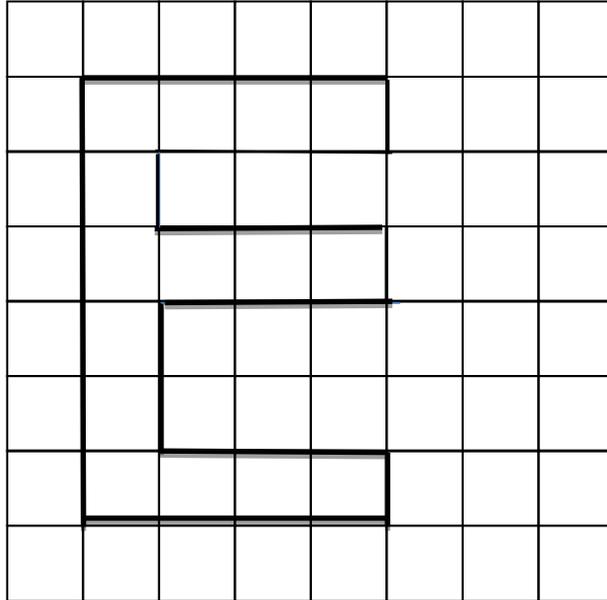
3) The number 7 is shown in the diagram.

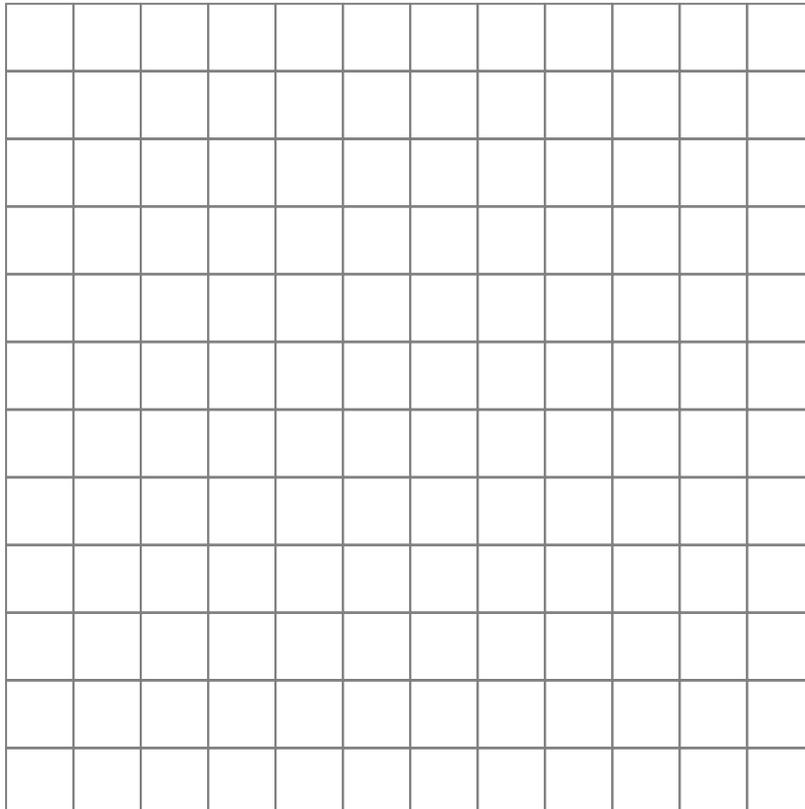Using the grid below, draw a reduction of this number 7 using a scale factor of $\frac{1}{2}$.
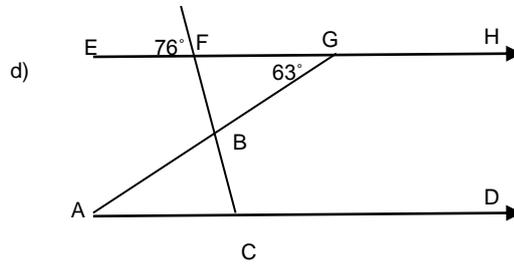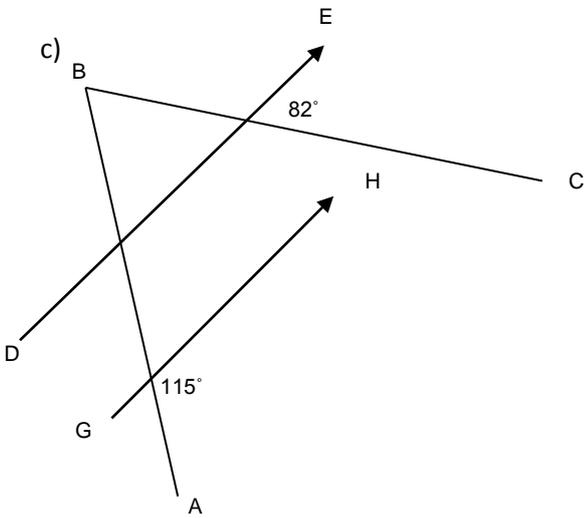
4) The letter E is shown in the diagram.

```
Using the grid below, draw a reduction of this letter E using a scale factor of $\frac{3}{2}$.
```
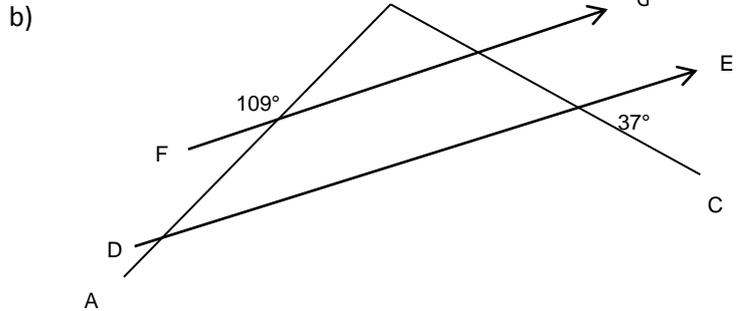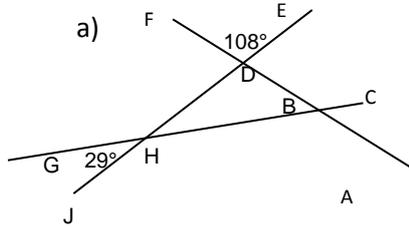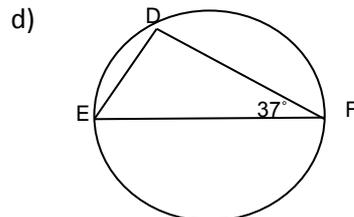
Using parallel lines, symmetry and circle properties to calculate angles.

1) For each diagram find the value of the angle ABC

a)

E
F
108°
D
B   C
G 29° H
J   A

b)

B
G
109°   E
F   37°
D   C
A

c)

E
B
82°
H   C
D
115°
G
A

d)

E   76° F   G   H
63°
B
A   D
C

2)   Find the size of the angle DEF in each of the following:

a)

D
E   67° F

b)

21°
E   F

c)

F
46°   E
D

d)

D
E   37° F

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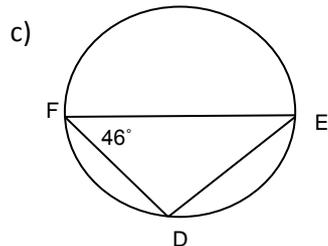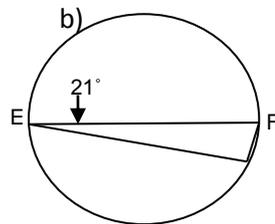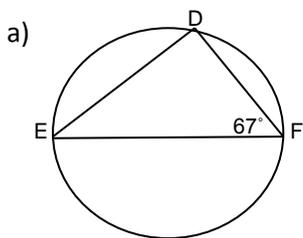
Using Pythagoras' theorem (2)

1) On the grid shown, the end-points of a line are (1,5) and (5, 8).

Calculate the length of the line.
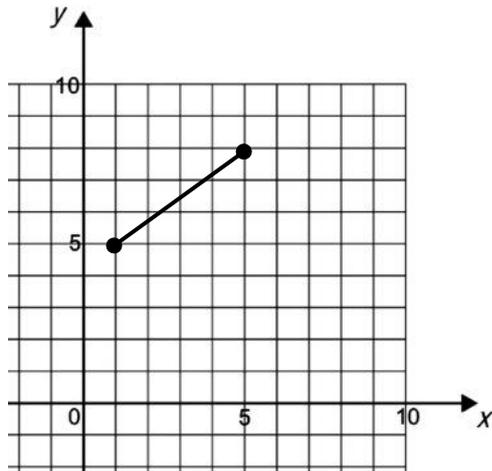
2) On the grid shown, the end-points of a line are (1,2) and (5, 5).

Calculate the length of the line.

3) On the grid shown, the end-points of a line are (1,2) and (7, 10).

   Calculate the length of the line.
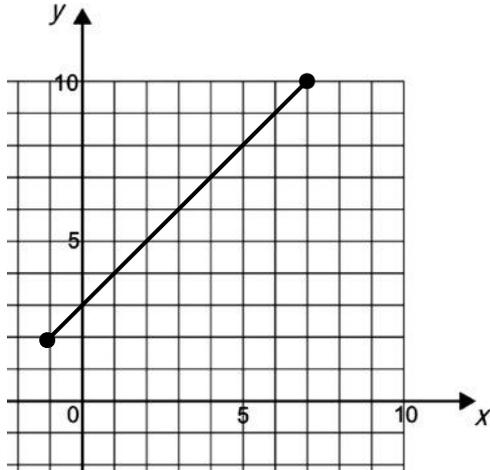
4) On the grid shown, the end-points of a line are (0,8) and (8, -2).

   Calculate the length of the line.

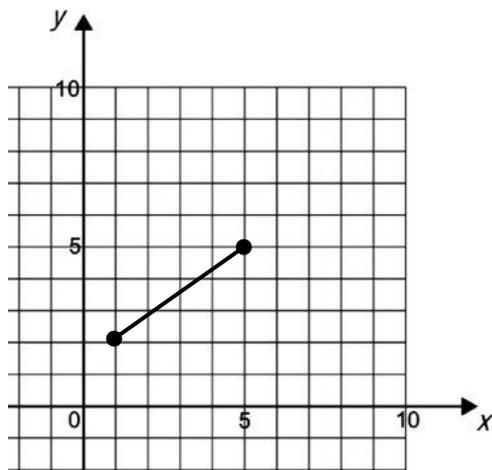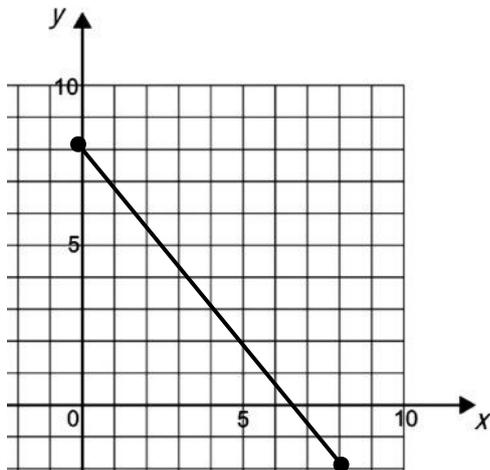## Self Assessment Summary- 1.3 Applying trigonometric skills to right-angled triangles

Assessment standard	Traffic Lights			Pupils Signature	Parents Signature
Calculating a side in a right-angled triangle.					

1.3 Applying trigonometric skills to right-angled triangles

Calculating a side in a right-angled triangle.

1) Calculate the length of side x in the right-angled triangles below.

a)

12 m

x

34°

b)

x

28°

7 cm

c)

x

42°

8.5 m

d)

18 m

64°

x
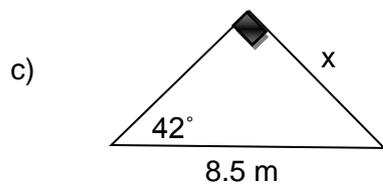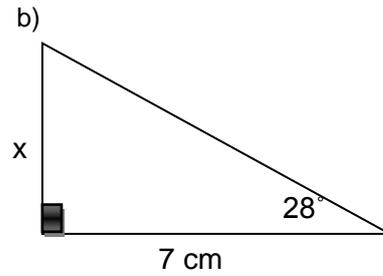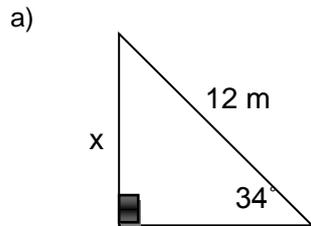
2) In each of the following right angled triangles find the size of the angle $x°$.

a)

5

$x°$

4

b)

$x°$

17

14

c)

37

$x°$

35

12

d)

22

$x°$
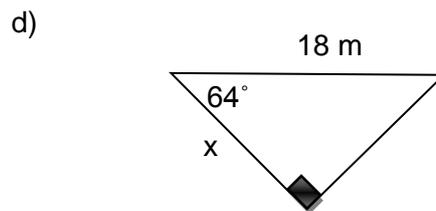
21

75
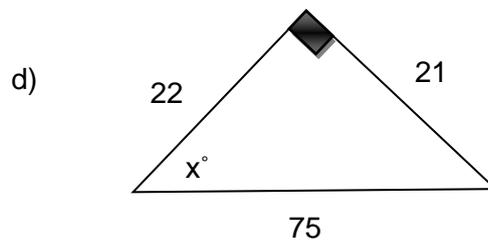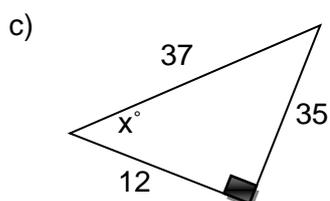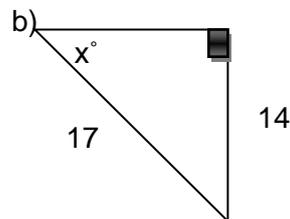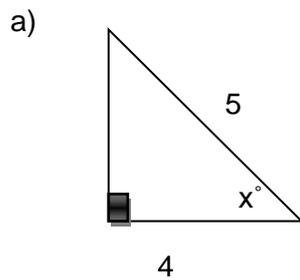
Self Assessment Summary- 1.4 Applying statistical skills to representing data

Assessment standard	Traffic Lights			Pupils Signature	Parents Signature
	🟩	🟨	🟥		
Constructing a scatter graph, and drawing and applying a best-fitting straight line					

Self Assessment Summary- 1.4 Applying statistical skills to representing data

1.4 Applying statistical skills to representing data

Constructing a scatter graph, and drawing and applying a best-fitting straight line

1) Sandra looked through the used car adverts in the local paper.
   She noted the prices and ages of the cars.

Age of Car (years)	2	3.5	1	1.5	4.5	2.5	1.5	3.5	0.5
Price in paper (£1000)	3	2	6	7	1	4	5	3	7

   a) Draw suitable scales and make a suitable diagram of the data.
   b) Draw a line of best fit on the scatter diagram
   c) Andrew is looking to sell his car which is 0.5 years old. How much should he advertise it for?
   d) Paula is selling her 5 year old car for £1500 is this a reasonable amount?

2) Last term Mr Johnstone tested the pupils in his French set. He did the same this term, here are the results:

Last term	5	3	6	7	5	6	3	6	5
This term	14	4	12	18	8	14	12	2	10

   a) Draw suitable scales and make a suitable diagram of the data.
   b) Draw a line of best fit on the scatter diagram
   c) This term someone was absent from the test they scored 4 last term Suggest a reasonable score for them this term
   d) Leona scored 1 last term and 8 this term explain if this is reasonable

3) News Smart want to analyse the time it takes there paper boys and girls to do their runs.

Time (min)	50	45	40	40	30	25	20	30	35	28
Newspapers	60	50	45	48	44	36	30	34	43	38

   a) Draw suitable scales and make a suitable diagram of the data.
   b) Draw a line of best fit on the scatter diagram
   c) Estimate how long it will take Jason to deliver 55 papers
   d) Stacey takes 70 minutes to deliver 30 papers is this reasonable?

4) Mal wants to find out if there is any link between a poor defence, in football and the number of points the team has. He chooses ten teams

Goals against	9	28	19	10	13	20	14	24	16	22
Points	25	5	11	24	17	9	16	7	12	6

   a) Draw suitable scales and make a suitable diagram of the data.
   b) Draw a line of best fit on the scatter diagram
   c) Describe the link between goals against and points.
   d) A team has 20 points. Estimate the number of goals scored against it.

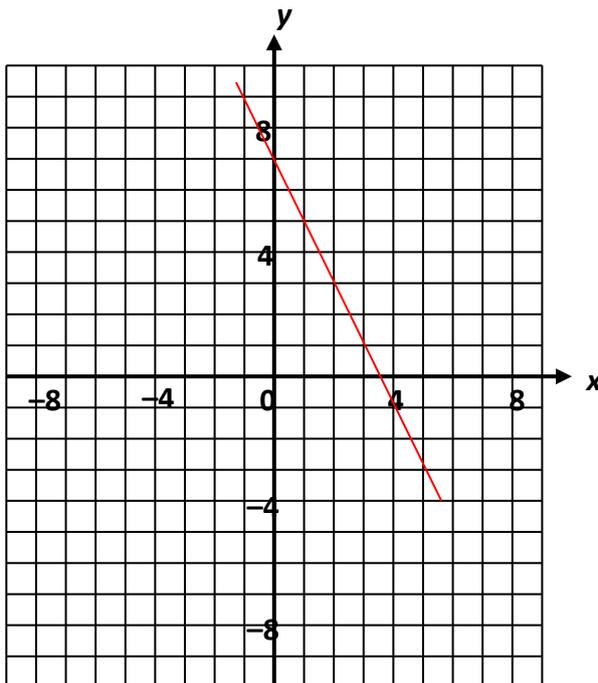## Answers to 1.1 Applying algebraic skills to linear equations
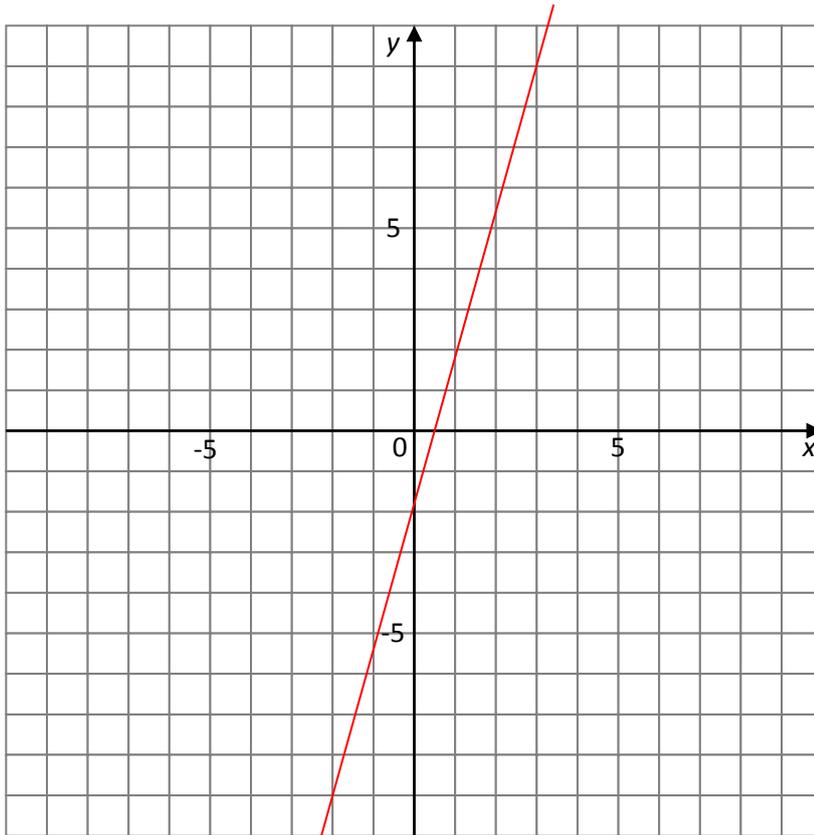
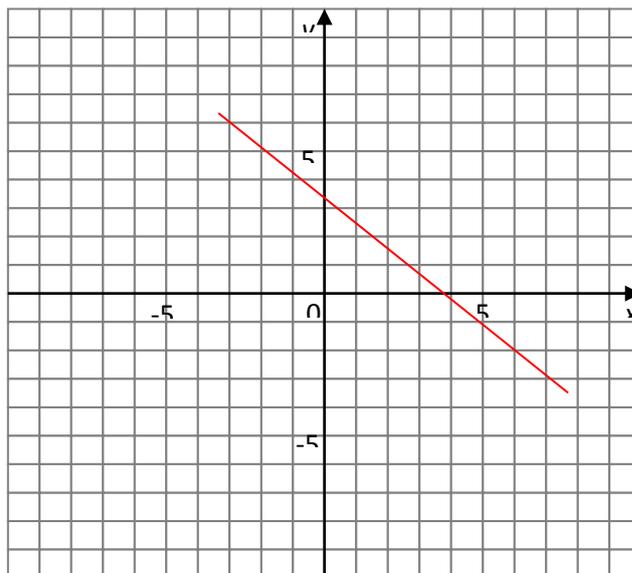**Drawing and recognising a graph of a linear equation.**

1)
a)

x	− 1	3	5
y	9	1	-3

b)

2)

x	−2	1	4
y	-8	1	10

3)

x	-1	0	2	3
y	5	4	2	1

4)

x	-1	0	2	3
y	-4	-1	5	8
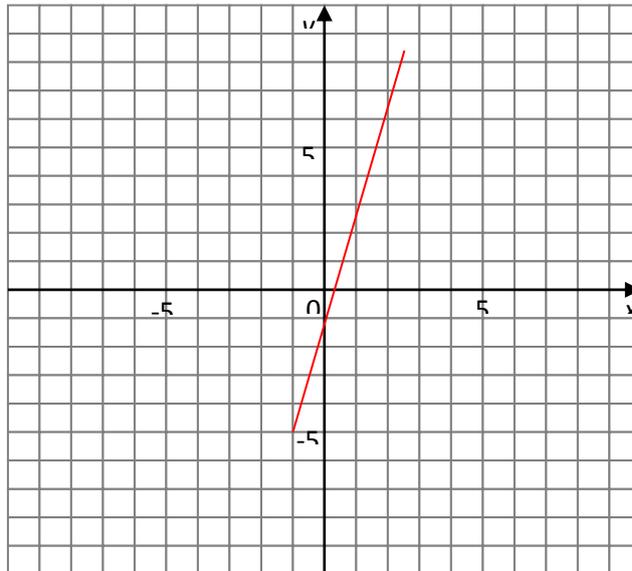
Drawing and recognising a graph of a linear equation

1) a) y=7   b) x=3   c) x=-6   d) y=2

Solving linear equations.

1) a) x=7   b) y=2   c) r=1   d) f=8

Changing the subject of a formula.

1) $s = \dfrac{D}{T}$

2) $a = \dfrac{F}{m}$

3) $b = \dfrac{A}{l}$

4) $D = \dfrac{C}{\pi}$

5) $c\dfrac{b-4}{3}$

6) $d = \dfrac{f+9}{6}$

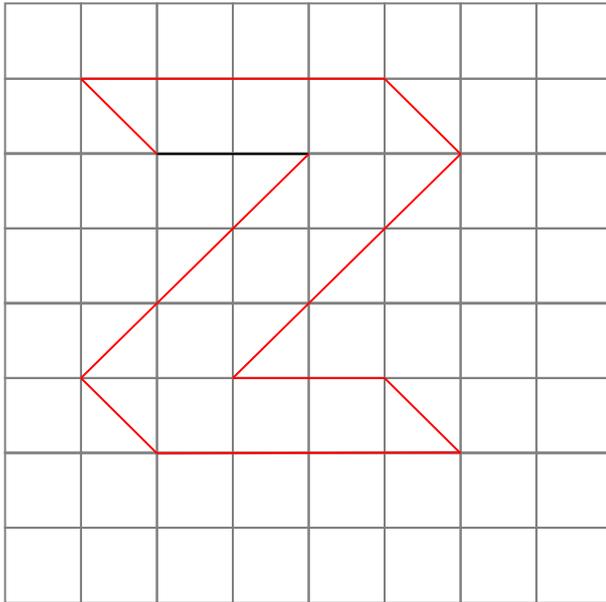7) $x = \dfrac{y+2}{3}$

8) $s = \dfrac{r - 4}{4}$

Answers to 1.2 Applying geometric skills to sides and angles of shapes
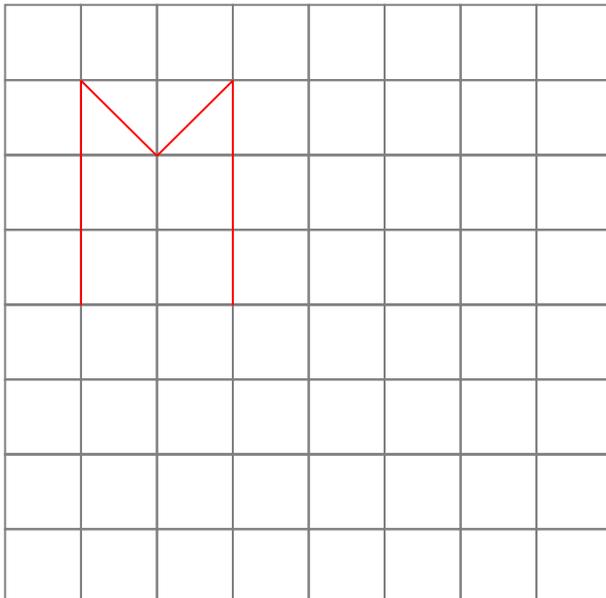
Using Pythagoras' theorem.

1) a) AC=4   b) DF= 12   c) QR=40   d) XY=24

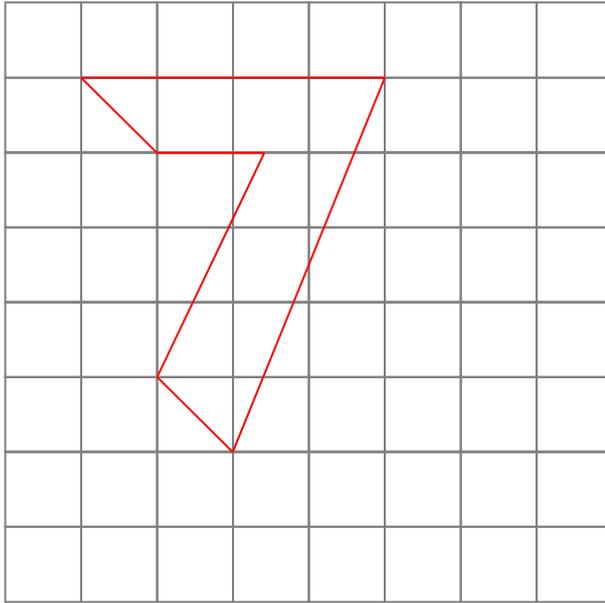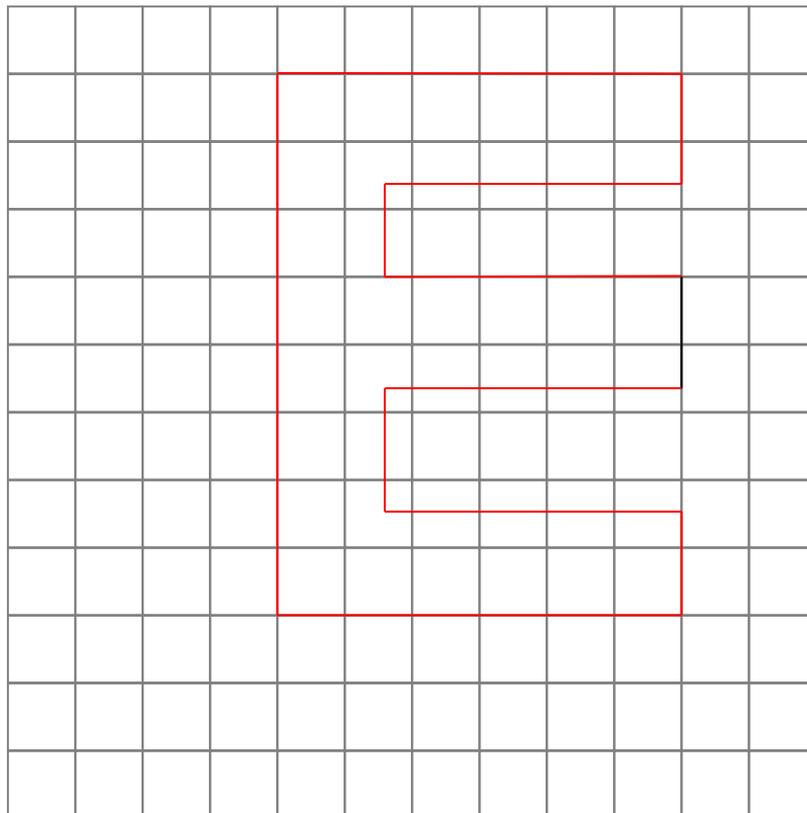## Using a fractional scale factor to enlarge or reduce a shape.

1)

2)

Suzanne Stoppard, Dumfries and Galloway Council

3)

4)

Using parallel lines, symmetry and circle properties to calculate angles.

1) a) 43°   b) 72°   c) 33°   d) 13°

2) a) 23°   c) 69°   c) 44°   d) 53°

Using Pythagoras' theorem

1) a) 5   b) 5   c) 10   d) 12.8

Calculating a side in a right-angled triangle.

1) a) 6.7   b) 3.7   c) 5.7   d) 7.9

2) a) 36.9°   b) 55.4°   c) 71.1°   d) 16.3°

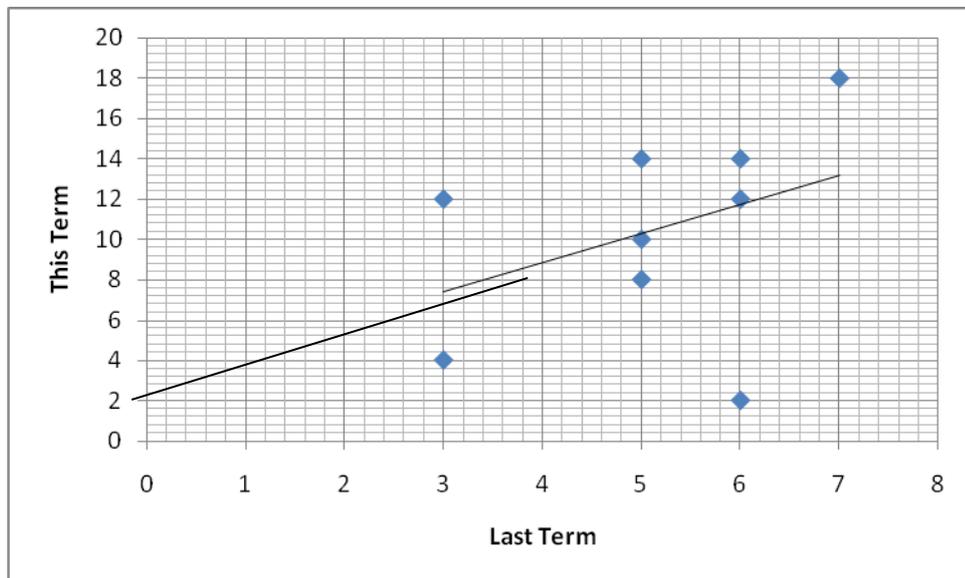## 1.4 Applying statistical skills to representing data

Constructing a scattergraph, and drawing and applying a best-fitting straight line
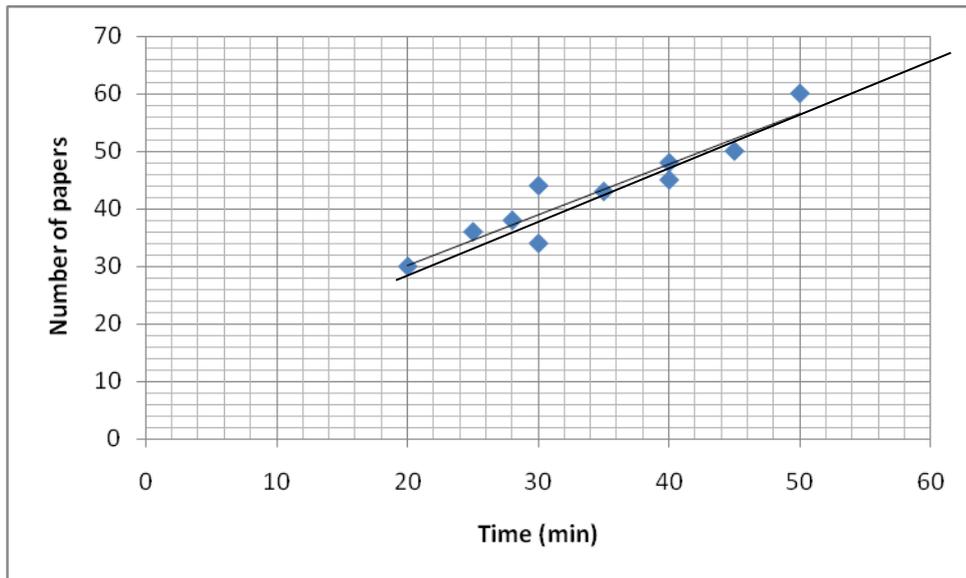
1) a)
   b)
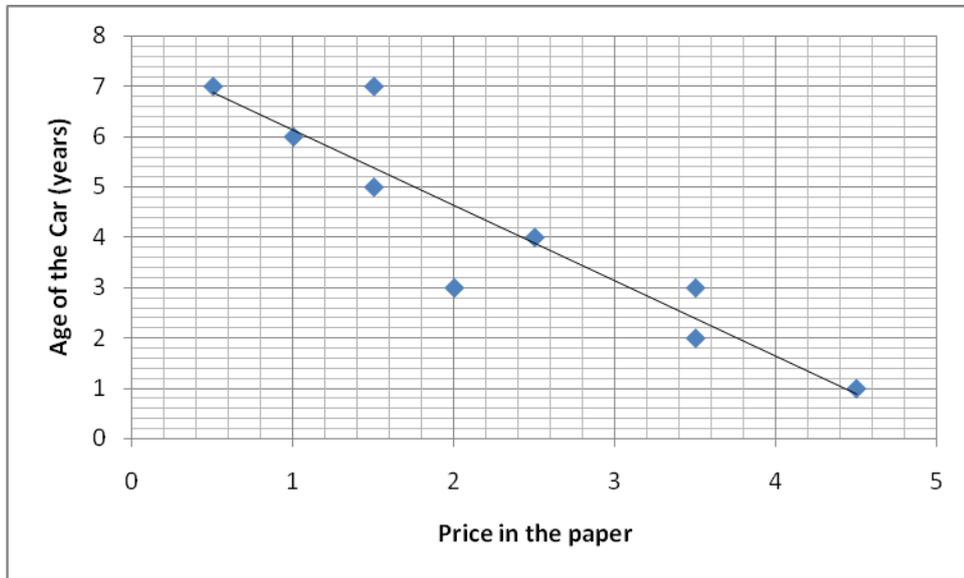
   c) £7000
   d) No this is above the average for the age of the car

2) a)
   b)

   c) 8
   d) 4
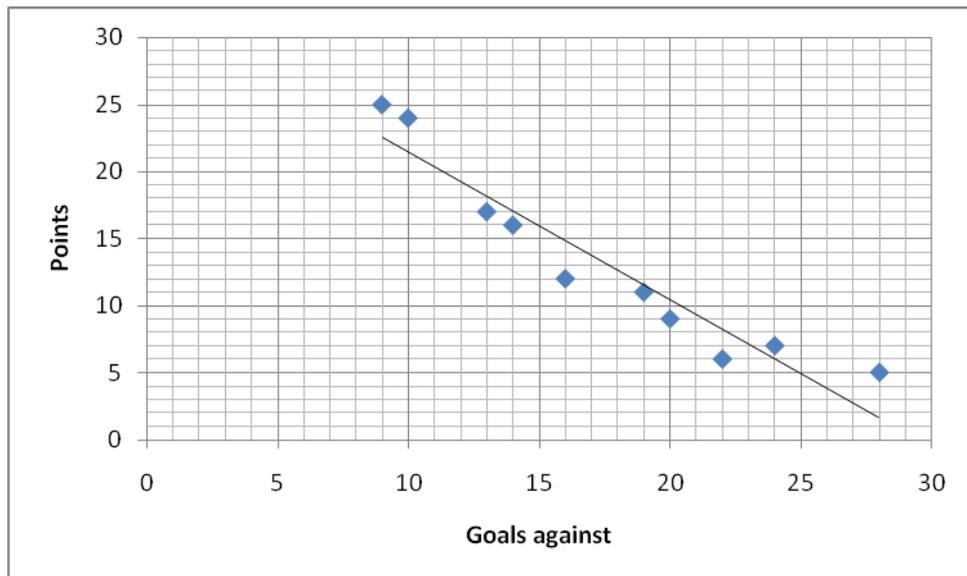
3) a)
   b)

c) 62 min
d) No

4) a)

c) The more goals scored against a team the less points they are likely to gain.