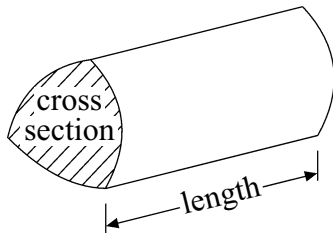


## GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

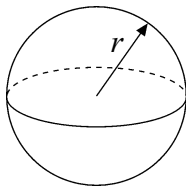
**You must not write on this formulae page.**  
**Anything you write on this formulae page will gain NO credit.**

**Volume of a prism** = area of cross section  $\times$  length



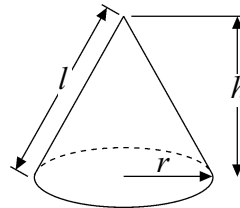
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$

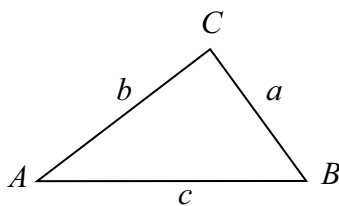


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$

where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

1. Each student at a college studies one of four languages.

The table shows the probability a student chosen at random studies German or Russian or French.

Language	German	Spanish	Russian	French
Probability	0.2		0.1	0.5

A student is chosen at random.

- (a) Work out the probability that the student studies Spanish.

.....  
(2)

There are 800 students at the college.

- (b) Work out the number of students who study German.

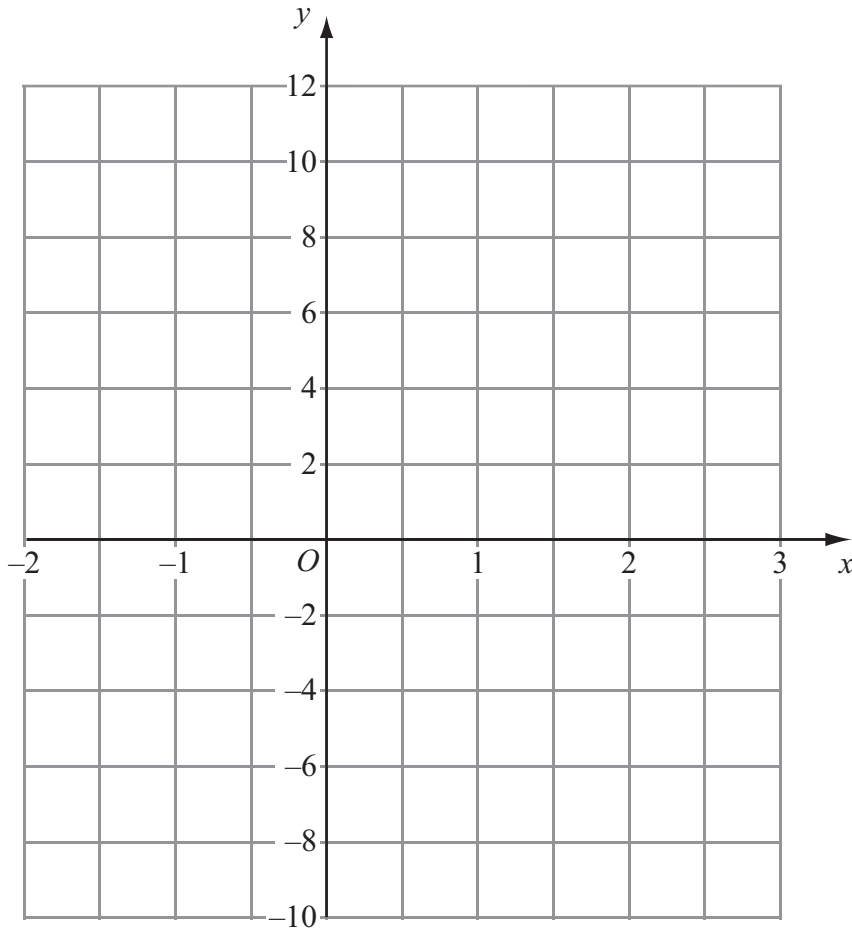
.....  
(2)

**(Total 4 marks)**

Q1



2. On the grid, draw the graph of  $y = 4x - 2$



(Total 3 marks) Q4



3. Here are the ages, in years, of 16 people.

36    48    18    25    36    28    45    30  
38    27    41    16    36    48    28    21

(a) Draw an ordered stem and leaf diagram to show this information.  
You must include a key.



Key:

(3)

(b) Find the median age.

..... years  
(2)

(Total 5 marks)

Q6



4.

Bob has 120 beads.  
The beads are either red or green.

Bob gives  $\frac{3}{4}$  of the beads to his friend.

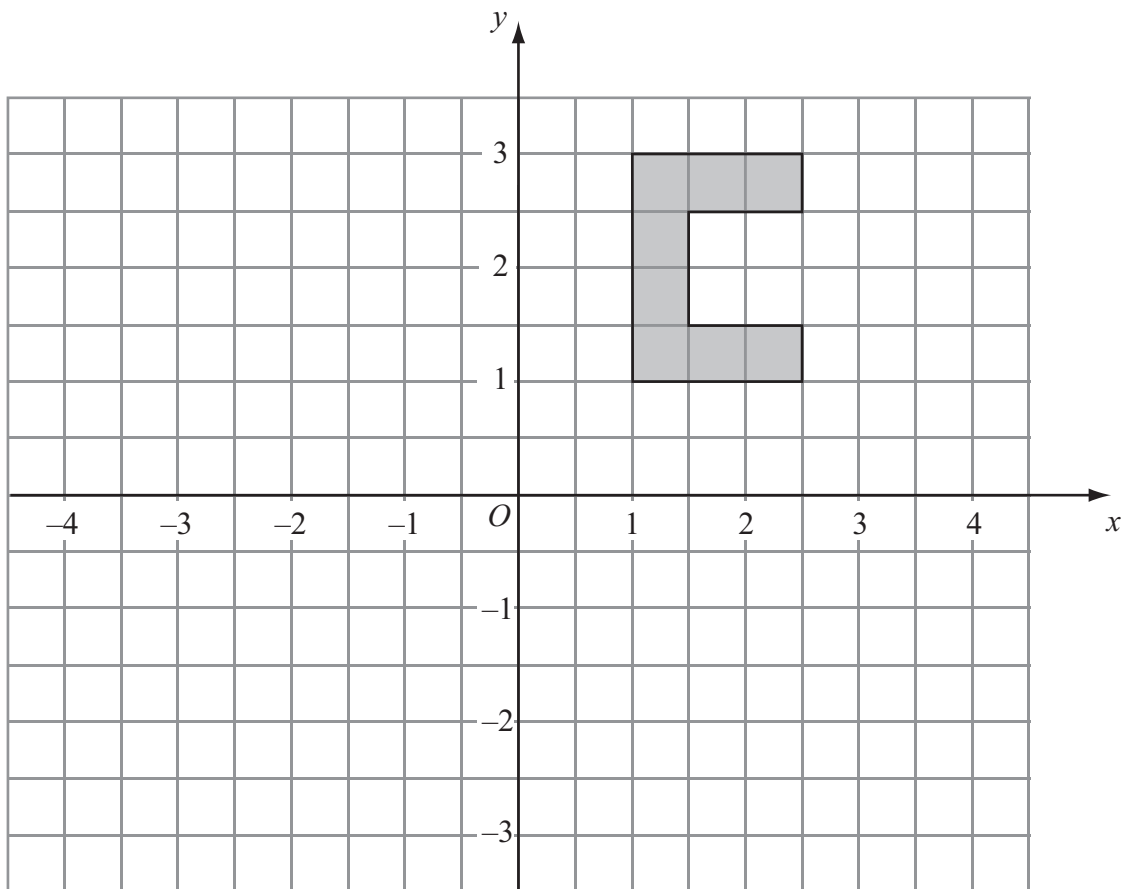
$\frac{2}{3}$  of the beads Bob now has are red.

Work out how many green beads Bob now has.

.....  
**(Total 3 marks)**

Q7

5.



Rotate the shape  $90^\circ$  clockwise, centre  $O$ .

**(Total 2 marks)**

Q8



6.

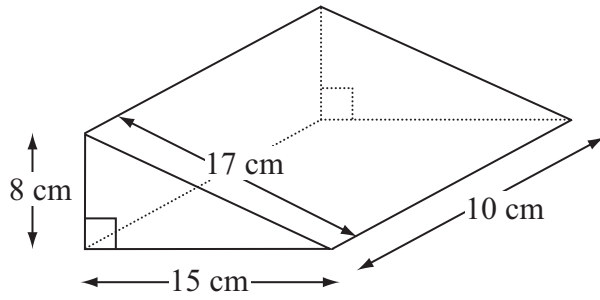


Diagram **NOT** accurately drawn

Work out the **total** surface area of the triangular prism.

.....

**(Total 4 marks)**

Q9



7.

(a) Simplify  $6e + 5f + e - 3f$

.....  
(2)

(b) Solve  $4(2x - 1) = 3x - 19$

$x =$  .....  
(3)

(c) Solve  $\frac{y+4}{5} = 30$

$y =$  .....  
(2)

**(Total 7 marks)**

Q10



8.

Bianca asked 32 women about the number of children they each had.

The table shows information about her results.

Number of children	Frequency	
0	9	
1	6	
2	7	
3	8	
4	2	
more than 4	0	

(a) Find the mode.

.....  
(1)

(b) Calculate the mean.

.....  
(3)

(Total 4 marks)

Q11





9. The equation

$$x^3 + 5x = 67$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.  
 Give your answer correct to one decimal place.  
 You must show **ALL** your working.

$x = \dots\dots\dots$

**(Total 4 marks)**

Q12

10. Use your calculator to work out

$$\sqrt{\frac{920 - 170 \tan 65^\circ}{0.012 + 0.034}}$$

(a) Write down all the figures on your calculator display.  
 You must write your answer as a decimal.

$\dots\dots\dots$

**(2)**

(b) Give your answer to part (a) correct to 3 significant figures.

$\dots\dots\dots$

**(1)**

**(Total 3 marks)**

Q13



11. The diagram shows two similar triangles.

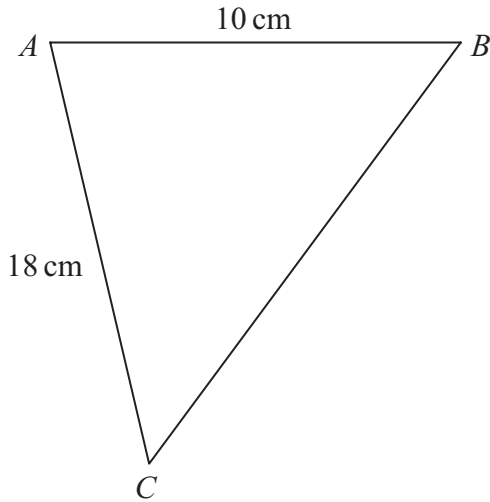
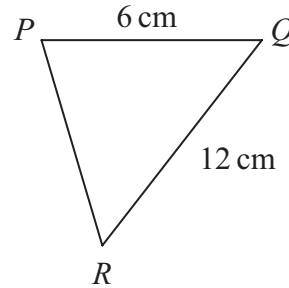


Diagram **NOT** accurately drawn



In triangle  $ABC$ ,  $AB = 10\text{ cm}$  and  $AC = 18\text{ cm}$ .  
 In triangle  $PQR$ ,  $PQ = 6\text{ cm}$  and  $QR = 12\text{ cm}$ .

Angle  $ABC = \text{angle } PQR$ .  
 Angle  $CAB = \text{angle } RPQ$ .

(a) Calculate the length of  $BC$ .

..... cm  
 (2)

(b) Calculate the length of  $PR$ .

..... cm  
 (2)

(Total 4 marks)

Q17



12. There are three secondary schools in Banley.  
The table shows the number of students in each of these schools.

Adis College	Greslow High	Fripp School
750	700	900

Germaine takes a sample of 50 students stratified by school.

Work out the number of students from Greslow High in the sample.

Q22

.....  
(Total 2 marks)



13.

There are 5 red pens, 3 blue pens and 2 green pens in a box.

Gary takes at random a pen from the box and gives the pen to his friend.  
Gary then takes at random another pen from the box.

Work out the probability that both pens are the same colour.

Q24

.....

**(Total 4 marks)**

