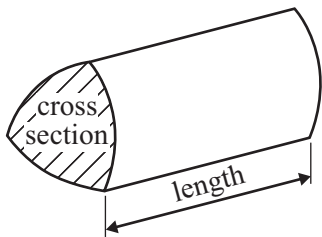


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

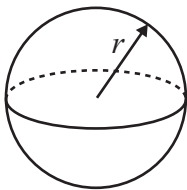
**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

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



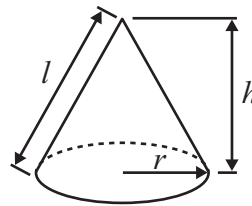
Volume of sphere = $\frac{4}{3} \pi r^3$

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

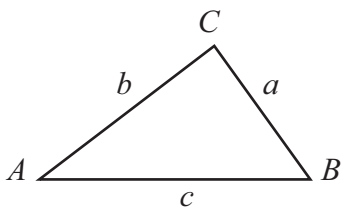


Volume of cone = $\frac{1}{3} \pi r^2 h$

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 = $\frac{1}{2} ab \sin C$

Answer ALL SIXTEEN questions. Write your answers in the spaces provided. You must write down all stages in your working.

1. Here are the first five terms in a number sequence.

5 9 13 17 21

Find the 10th term in this number sequence.

.....

(Total 2 marks)

Q1

2. A rugby team played six games.
The mean score for the six games is 14.5
- The rugby team played one more game.
The mean score for all seven games is 16

Work out the number of points the team scored in the seventh game.

..... points

(Total 2 marks)

Q2

3. Rosie and Jim are going on holiday to the USA.

Jim changes £350 into dollars (\$).

The exchange rate is £1 = \$1.34

(a) Work out how many dollars (\$) Jim gets.

\$
(2)

In the USA Rosie sees some jeans costing \$67

In London the same make of jeans costs £47.50

The exchange rate is still £1 = \$1.34



(b) Work out the difference between the cost of the jeans in the USA and in London.
Give your answer in pounds (£).

£
(3)

(Total 5 marks)

Q3

4. John needs 4 tyres for his car.

He pays for 3 tyres and gets one tyre free.
The tyres cost £65 each plus VAT at 20%.

Work out how much in total John pays for the tyres.

Offer of the week
4 for the price of 3



£65 each plus VAT

£

(Total 4 marks)

Q4

5. (a) Use your calculator to work out $\frac{\sqrt{2.5^2 + 3.75}}{3.9 - 1.7}$

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

.....
(3)

(b) Write your answer to part (a) correct to 2 decimal places.

.....
(1)

(Total 4 marks)

Q5

6. The equation $x^3 + 3x = 41$

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)

Q6

7.

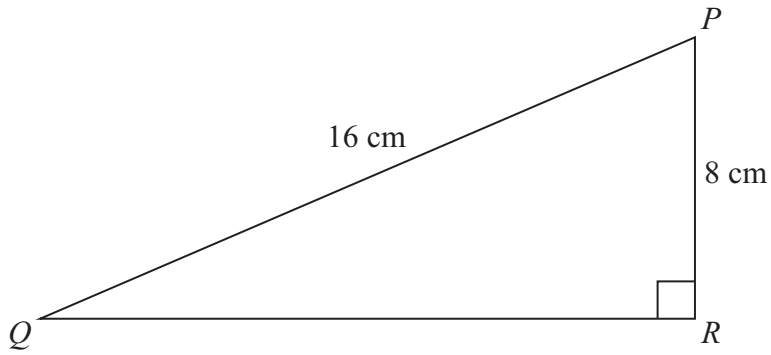


Diagram **NOT** accurately drawn

PQR is a right-angled triangle.

$PQ = 16$ cm.

$PR = 8$ cm.

Calculate the length of QR .

Give your answer correct to 2 decimal places.

..... cm

(Total 3 marks)

Q7

8. (a) Simplify $x^5 \times x^4$

.....
(1)

(b) Simplify $y^7 \div y^2$

.....
(1)

(c) Expand and simplify $3(2a + 5) + 5(a - 2)$

.....
(2)

(d) Expand and simplify $(y + 5)(y + 7)$

.....
(2)

(e) Factorise $p^2 - 6p + 8$

.....
(2)

(Total 8 marks)

Q8

9. Riki has a packet of flower seeds.

The table shows each of the probabilities that a seed taken at random will grow into a flower that is pink or red or blue or yellow.

Colour	pink	red	blue	yellow	white
Probability	0.15	0.25	0.20	0.16	

(a) Work out the probability that a seed taken at random will grow into a white flower.

.....
(2)

There are 300 seeds in the packet.

All of the seeds grow into flowers.

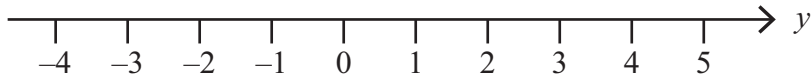
(b) Work out an estimate for the number of red flowers.

.....
(2)

(Total 4 marks)

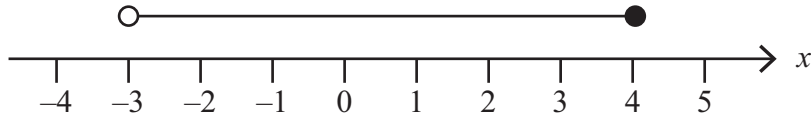
Q9

10. (a) On the number line below, show the inequality $-2 < y < 3$



(1)

(b) Here is an inequality, in x , shown on a number line.



Write down the inequality.

.....
(2)

(c) Solve the inequality $4t - 5 > 9$

.....
(2)

(Total 5 marks)

Q10

11. Sylvie shares £45 between Ann, Bob and Cath in the ratio 2 : 3 : 4

Work out the amount each person gets.

Ann

Bob

Cath

(Total 3 marks)

Q11

12. $ABCD$ is a trapezium.

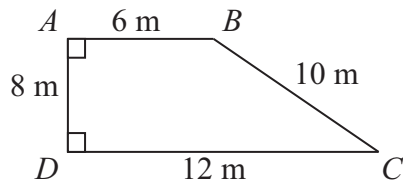


Diagram **NOT** accurately drawn

Work out the area of the trapezium.

..... m²

(Total 2 marks)

Q12

13. PQR is a right-angled triangle.

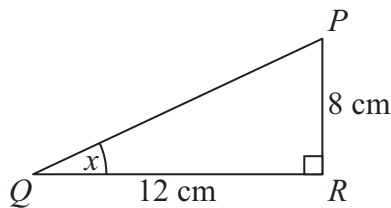


Diagram **NOT** accurately drawn

$PR = 8$ cm.

$QR = 12$ cm.

- (a) Find the size of the angle marked x .
Give your answer correct to 1 decimal place.

..... °

(3)

XYZ is a different right-angled triangle.

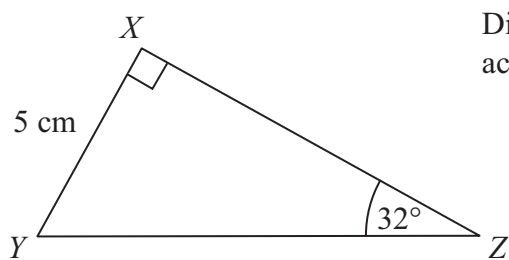


Diagram **NOT** accurately drawn

$XY = 5$ cm.
Angle $Z = 32^\circ$.

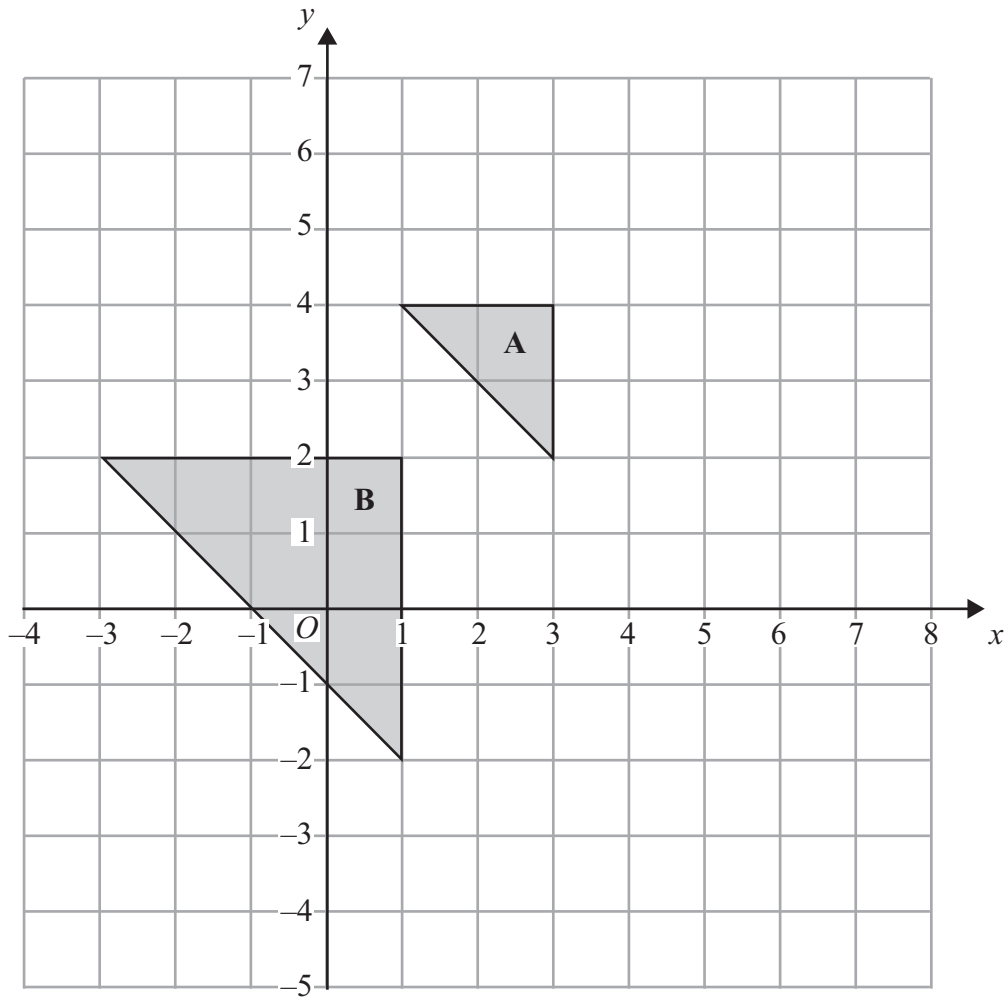
- (b) Calculate the length YZ .
Give your answer correct to 3 significant figures.

..... cm
(3)

(Total 6 marks)

Q13

14.



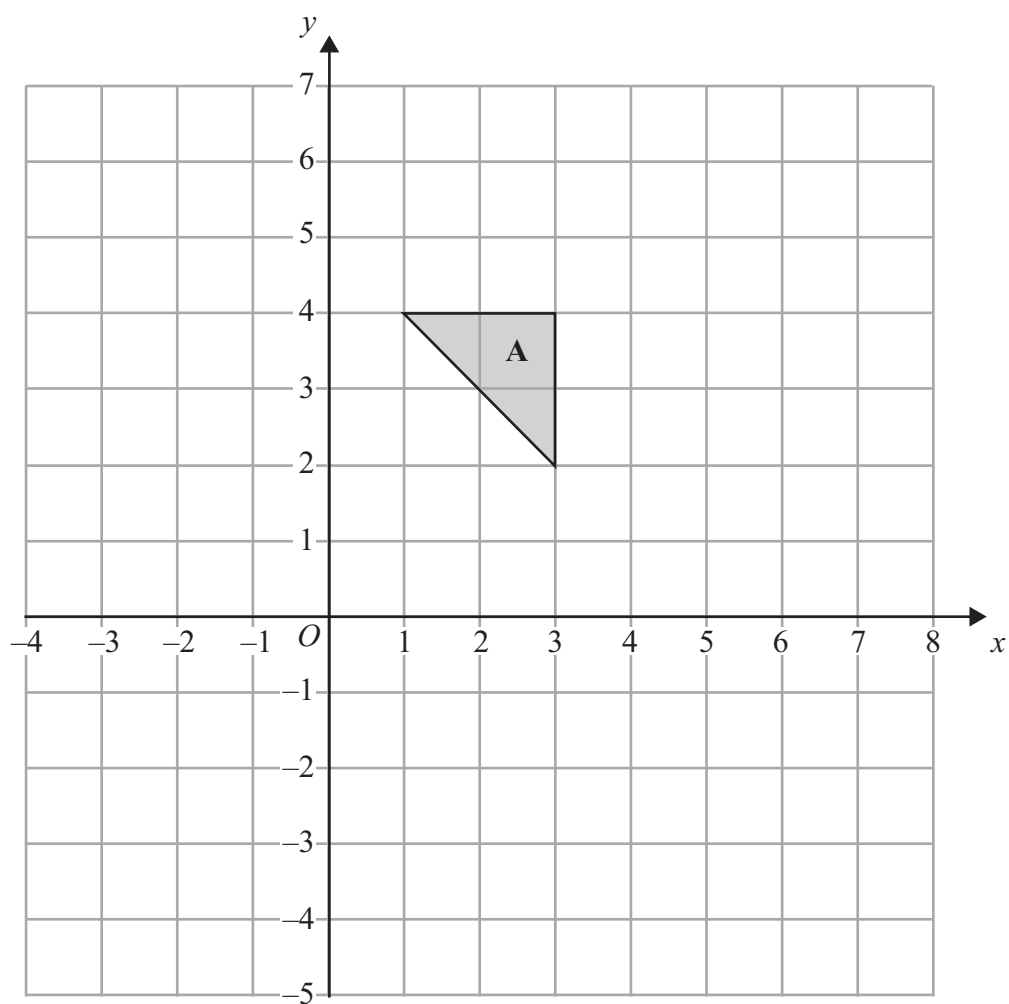
Triangle **A** and triangle **B** are drawn on the grid.

(a) Describe fully the single transformation which maps triangle **A** onto triangle **B**.

.....

.....

(3)



(b) Reflect triangle A in the line $x = 4$

(2) Q14

(Total 5 marks)

15. Solve the equations

$$\begin{aligned} 3x + 5y &= 19 \\ 4x - 2y &= -18 \end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total 4 marks)

Q15

16. Solve the equation $5x^2 + 8x - 6 = 0$
Give each solution correct to 2 decimal places.

$\dots\dots\dots$

(Total 3 marks)

Q16