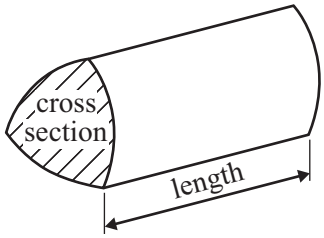
2015 Calculator Paper 5 Name:_____

GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

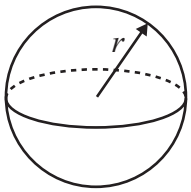
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Volume of a prism = area of cross section × length



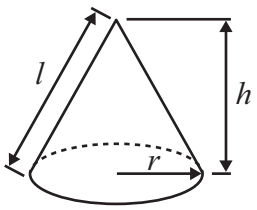
Volume of sphere $= \frac{4}{3}\pi r^3$

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

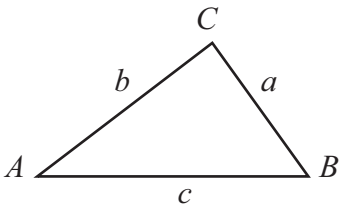


Volume of cone $= \frac{1}{3}\pi r^2 h$

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



In any triangle *ABC*



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

The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$, are given by

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

Leave blank

Answer ALL FIFTEEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

1. (a) Use your calculator to work out

$$\frac{\sqrt{21.5}}{5.8 - 2.36}$$

Write down all the figures on your calculator display.

.....

(2)

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

.....

(1) **Q1**

(Total 3 marks)

2. Ishmal invested £3500 for 3 years at 2.5% per annum **simple interest**.

Work out the total amount of interest Ishmal earned.

£ **Q2**

(Total 3 marks)

Leave blank

3. Gary wants to find out how much time teenagers spend listening to music.

He uses this question on a questionnaire.

How many hours do you spend listening to music?

☐	☐	☐	☐
1 to 5	5 to 10	10 to 20	over 20

(a) Write down **two** things wrong with this question.

1 .....

.....

2 .....

.....

(2)

(b) Design a better question for Gary's questionnaire to find out how much time teenagers spend listening to music.

(2) **Q3**

(Total 4 marks)

Leave blank

4. (a) Find the highest common factor (HCF) of 24 and 30

.....

(1)

(b) Find the lowest common multiple (LCM) of 4, 5 and 6

.....

(2)

Q4

(Total 3 marks)

5. Melissa is 13 years old.
Becky is 12 years old.
Daniel is 10 years old.

Melissa, Becky and Daniel share £28 in the ratio of their ages.
Becky gives a third of her share to her mother.

How much should Becky now have?

£ .....

Q5

(Total 4 marks)

Leave blank

6.

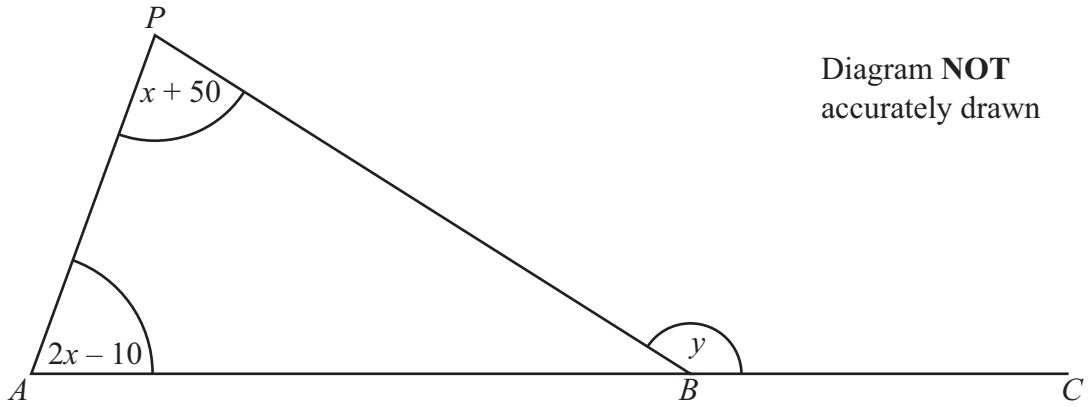


Diagram **NOT** accurately drawn

All angles are measured in degrees.

ABC is a straight line.
Angle *APB* = $x + 50$
Angle *PAB* = $2x - 10$
Angle *PBC* = y

(a) Show that $y = 3x + 40$
Give reasons for each stage of your working.

(3)

(b) Given that $y = 145$,

(i) work out the value of x,

$x =$ .....

(ii) work out the size of the largest angle in triangle *ABP*.

..... °

(4)

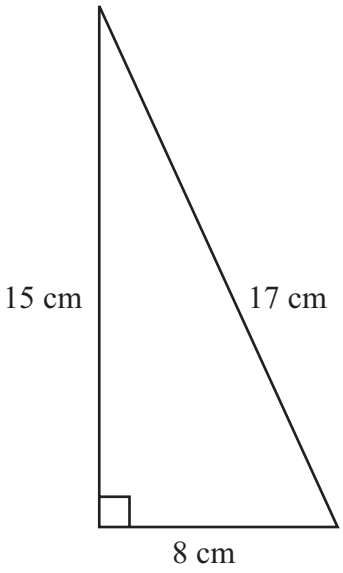
Q6

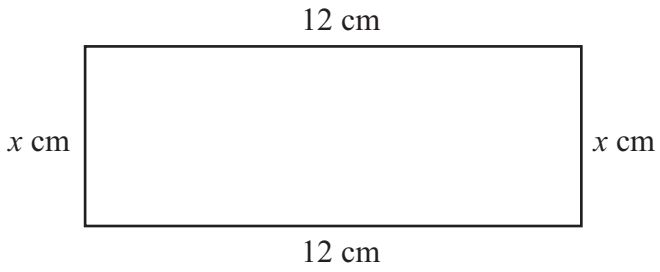
(Total 7 marks)

Leave blank

7. The diagrams show a right-angled triangle and a rectangle.

Diagrams **NOT** accurately drawn





The area of the right-angled triangle is equal to the area of the rectangle.

Find the value of x.

x = ...

(Total 4 marks)

Q7

Leave blank

8. The diagram shows a CD.
The CD is a circle of radius 6 cm.

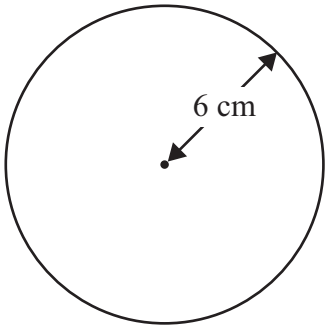


Diagram **NOT** accurately drawn

(a) Work out the circumference of the CD.

..... cm
(2)

CDs of this size are cut from rectangular sheets of plastic.
Each sheet is 1 metre long and 50 cm wide.

(b) Work out the greatest number of CDs that can be cut from one rectangular sheet.

.....
(2)
(Total 4 marks)

Q8

Leave blank

9. The exchange rate in London is £1 = €1.14
The exchange rate in Paris is €1 = £0.86

Elaine wants to change some pounds into euros.

In which of these cities would Elaine get the most euros?
You must show all of your working.

.....

Q9

(Total 3 marks)

Leave blank

10. The temperature (T°C) at noon at a seaside resort was recorded for a period of 60 days. The table shows some of this information.

Temperature (T°C)	**Number of days**
$10 < T \leqslant 14$	2
$14 < T \leqslant 18$	8
$18 < T \leqslant 22$	14
$22 < T \leqslant 26$	23
$26 < T \leqslant 30$	9
$30 < T \leqslant 34$	4

Calculate an estimate for the mean temperature at noon during these 60 days.
Give your answer correct to 3 significant figures.

.....°C **Q10**

(Total 4 marks)

Leave blank

11. (a) Simplify $m^3 \times m^6$

.....

(1)

(b) Simplify $\dfrac{p^8}{p^2}$

.....

(1)

(c) Simplify $(2n^3)^4$

.....

(2) **Q11**

(Total 4 marks)

12. $-2 \leqslant n < 5$
n is an integer.

(a) Write down all the possible values of n.

.....

(2)

(b) Solve the inequality $4x + 1 > 11$

.....

(2) **Q12**

(Total 4 marks)

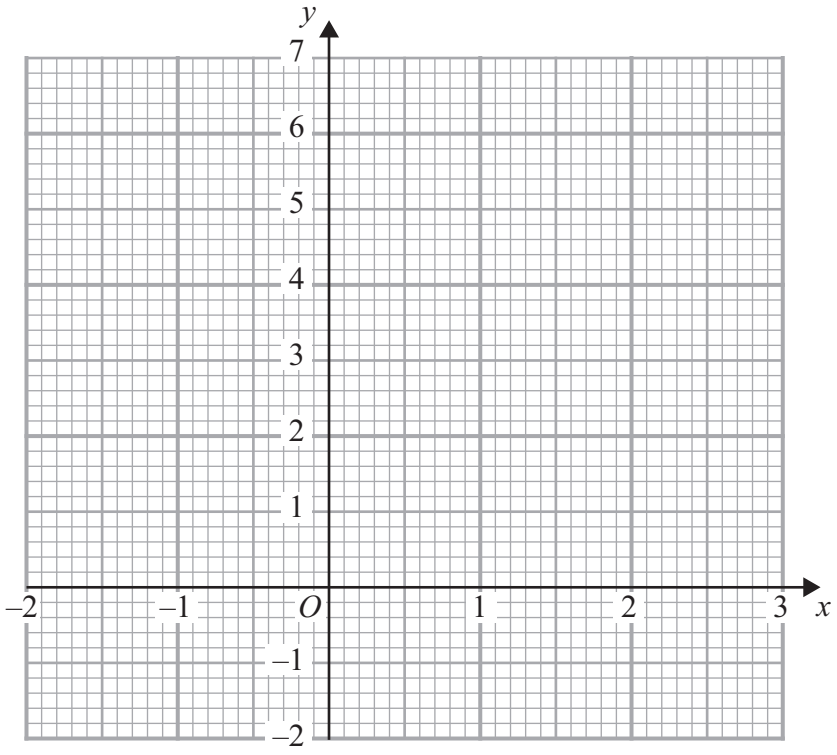
Leave blank

13. (a) Complete the table of values for $3x + 2y = 6$

x	-2	-1	0	1	2	3
y		4.5	3			-1.5

(2)

(b) On the grid, draw the graph of $3x + 2y = 6$



(2)

(c) Find the gradient of the graph of $3x + 2y = 6$

.....

(2) **Q13**

(Total 6 marks)

Leave blank

14. (a) Factorise $6x + 4$

.....

(1)

(b) Factorise fully $9x^2y - 15xy$

.....

(2)

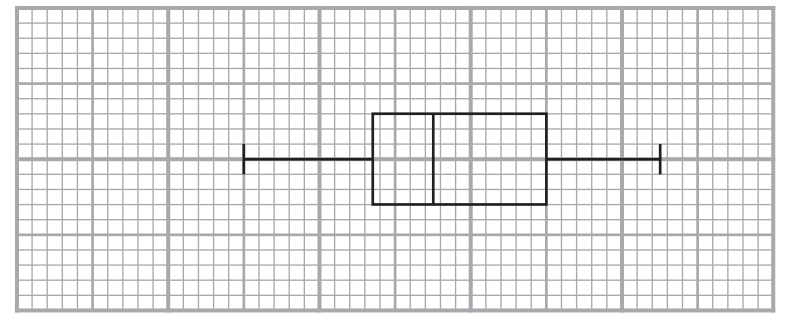
Q14

(Total 3 marks)

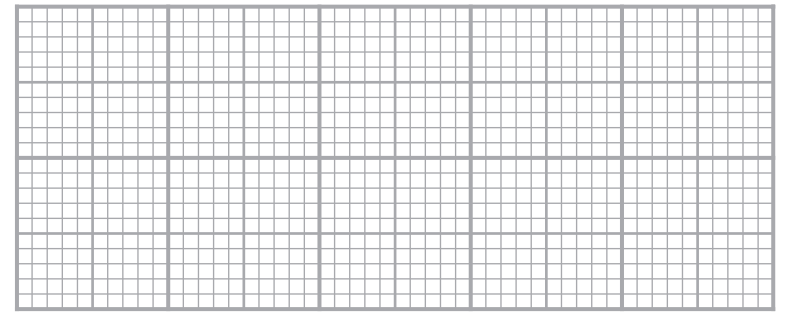
Leave blank

15. Barry drew an angle of 60°.
He asked some children to estimate the size of the angle he had drawn.
He recorded their estimates.
The box plot gives some information about these estimates.

Children's estimates



Adults' estimates



(a) Write down the median of the children's estimates.

..... °

(1)

(b) Find the interquartile range of the children's estimates.

..... °

(2)

Leave blank

Barry then asked some adults to estimate the size of the angle he had drawn.
The table gives some information about the adults' estimates.

	Angle
Lowest estimate	20°
Lower quartile	45°
Median	62°
Upper quartile	75°
Highest estimate	95°

(c) On the grid opposite, draw a box plot to show this information.

(2)

(d) Use the two box plots, to compare the distribution of the children's estimates with the distribution of the adults' estimates.

.....

.....

.....

.....

(2)

Q15

(Total 7 marks)