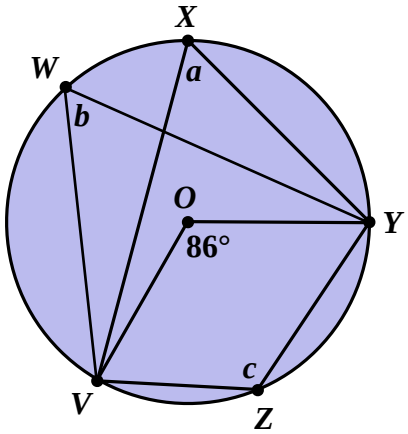
“Mind Your Maths” Number 3
Year 10 Exam Revision

You may use a calculator
Marks Available : 60

Question 1

In the diagram below O is the centre of the circle.
V, W, X, Y and Z are five points on the circumference of the circle.



Write down the size of the following angles,

(i) a

[1 mark]

(ii) b

[1 mark]

(iii) c

[1 mark]

Question 2

Solve the following inequalities.

(i) $x + 6 < 24$ **(ii)** $4x - 10 \geqslant 6$

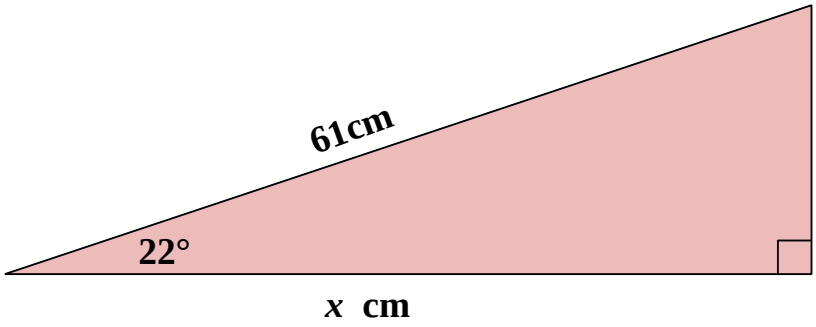
[1, 2 marks]

(iii) $3x + 5 > x + 11$ **(iv)** $5(x + 4) \leqslant 3(x + 7)$

[2, 3 marks]

Question 3

A right angled triangle has a hypotenuse of 61 cm.
It also contains a 22° angle, as shown below.



Use trigonometry to find the length of the side marked *x*.
Give your answer accurate to 1 decimal place.

[3 marks]

Question 4

In each of the following, make *c* the subject of the formula.

(i) $y = mx + c$

[1 mark]

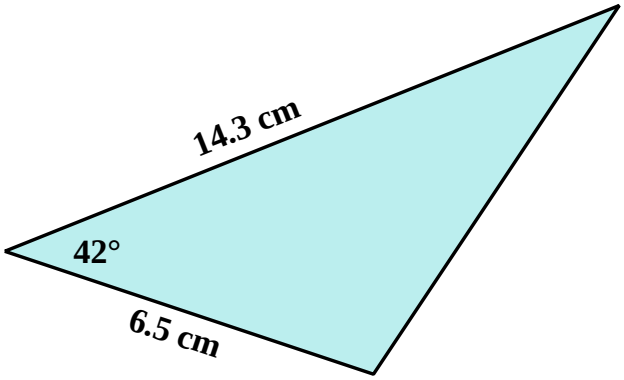
(ii) $E = mc^2$

[2 marks]

(iii) $f = \frac{9c}{5} + 32$

[2 marks]

Question 5



(a) Use the formula $Area\,\Delta = \frac{1}{2}\,ab\,sin\,C$ to calculate the triangle's area.
Give your answer correct to 1 decimal place.

[2 marks]

(b) Use the formula $c^2 = a^2 + b^2 - 2ab\,cos\,C$
to calculate the length of the triangle's unknown side.
Give your answer correct to 1 decimal place.

[3 marks]

Question 6

In January 2022 the Shropshire Star newspaper reported that house prices in Shrewsbury had risen, on average, by 12% in 2021.
Horace owns a house which was worth £420,000 at the start of 2021.
What does the statistic suggest it was worth one year later ?

[2 marks]

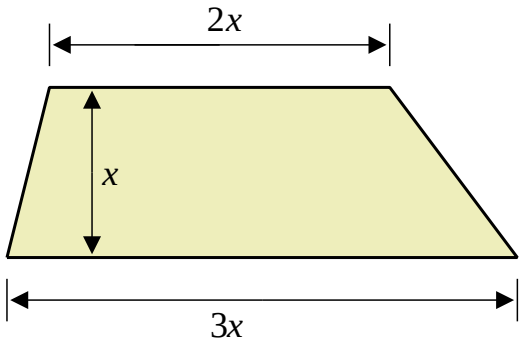
Question 7

Tim reads in a mathematics textbook that,

The area of a trapezium is half the sum of the parallel sides times the distance in between.

$$Area\ Trapezium = \frac{1}{2}(a + b)\,h$$

The trapezium shown below has an area of 1000 cm^2.



What is the length marked x ?

You must show all of your working.

[4 marks]

Question 8

Expand the brackets, $\left(5 - 3\sqrt{2}\right)\left(5 + 4\sqrt{2}\right)$

Give your answer in the form $a + b\sqrt{2}$ where a and b are integers to be found.

[3 marks]

Question 9

At sea, the distance, d km, it is possible to see a surface object on a clear day is directly proportional to the square root of an observer's height, h m, above sea level. On Brighton pier, 4 m above sea level, it is possible to see an object on the surface that is a distance of 10 km away.

(i) Find a formula for d in terms of h.

[3 marks]

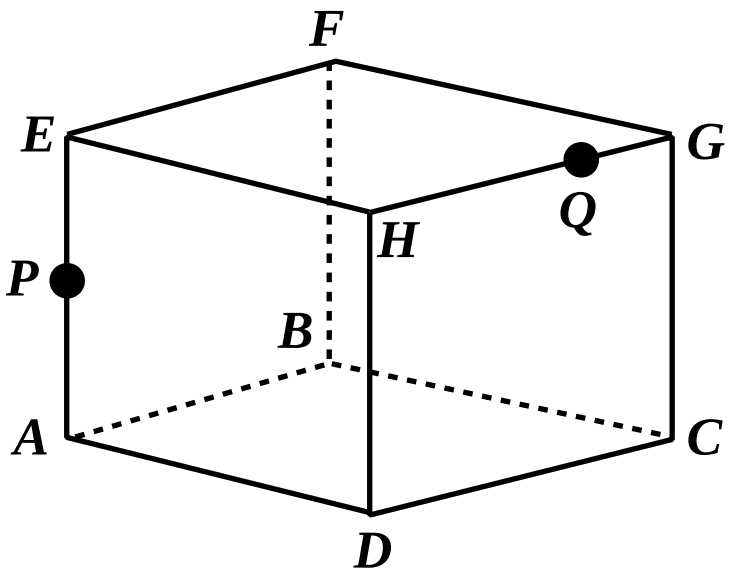
(ii) Standing on top of cliffs, I can see a distance of 35 km.
Use your part (i) answer to determine the height of the cliffs.

[2 marks]

Question 10

ABCDEFGH is a cube of side 4 cm.

AP = 2 cm and *HQ* = 3 cm.



Calculate;

(i) the lengths of *DQ*

[2 marks]

(ii) the length of *PD*

[3 marks]

(iii) the length of *PQ*

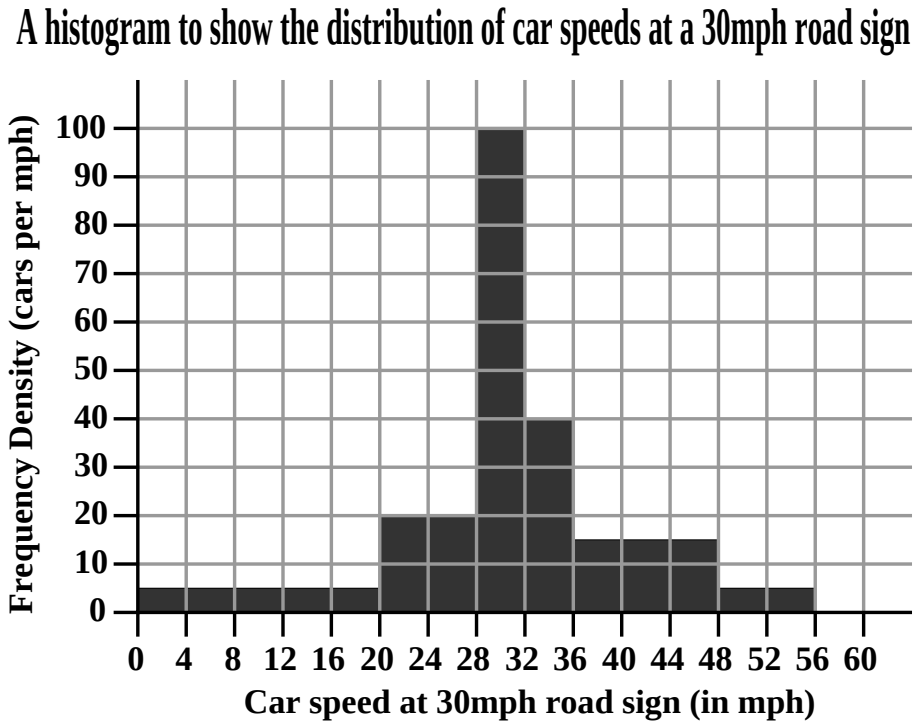
[3 marks]

(iv) the angle *QDP*

[4 marks]

Question 11

In trying to decide if a speed camera is required in the town of Numberville, a consultant provides the following histogram which shows the distribution of car speeds as cars pass the 30 mph sign heading into Numberville.



(i) Use the histogram to complete the following table :

Car speed (miles per hour, mph)	Number of cars Frequency = Area	Width	Height
$0 \leqslant m < 20$			
$20 \leqslant m < 28$			
$28 \leqslant m < 32$			
$32 \leqslant m < 36$			
$36 \leqslant m < 48$			
$48 \leqslant m < 56$			

[3 marks]

(ii) How many cars in total had their speed recorded entering Numberville ?

[1 mark]

(iii) What percentage of cars were travelling within 2 mph of the speed limit ?

[2 marks]

Question 12

Solve the simultaneous equations;

$$\begin{aligned} 4x + 9y &= 5 \\ 6x - 15y &= -2 \end{aligned}$$

[4 marks]