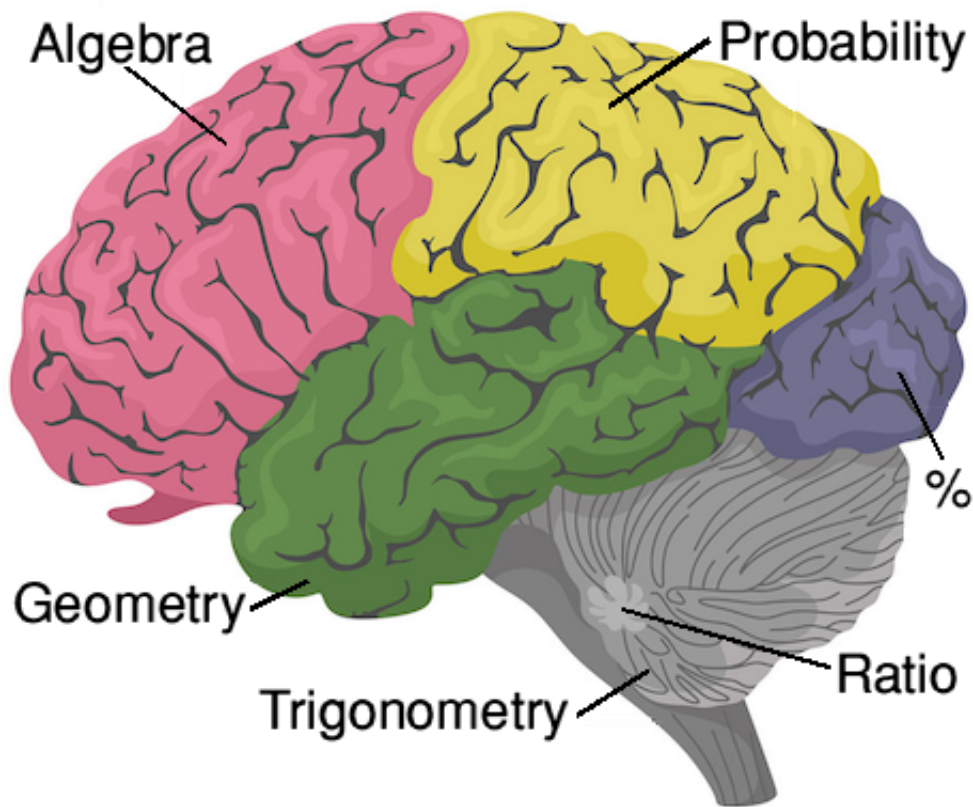


Mind Your Maths



Year 10
Summer Exam Revision

“Mind Your Maths” **Number 1**

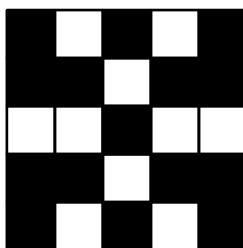
Year 10 Exam Revision

You may use a calculator

Marks Available : 60

Question 1

What percentage of the squares in this diagram are black ?



[2 mark]

Question 2

An ordinary fair dice with six faces numbered 1, 2, 3, 4, 5 and 6 is rolled.
State the probability of rolling,

(i) The number 4

[1 mark]

(ii) An odd number

[1 mark]

(iii) The number 0.5

[1 mark]

(iv) A number less than or equal to 2

[1 mark]

(v) A number greater than 2

[1 mark]

(vi) A number less than or equal to 6

[1 mark]

(vii) A factor of 6

[1 mark]

(viii) A square number

[1 mark]

Question 3

Twenty students were asked how they rated their *Effort at Exam Revision*. Here are the results:

****	**	**	***	*
***	****	****	**	**
**	**	*****	***	***
*****	***	**	***	**

Number of stars	*	**	***	****	*****
Frequency					

(i) Fill in the frequency row of the table.

[2 marks]

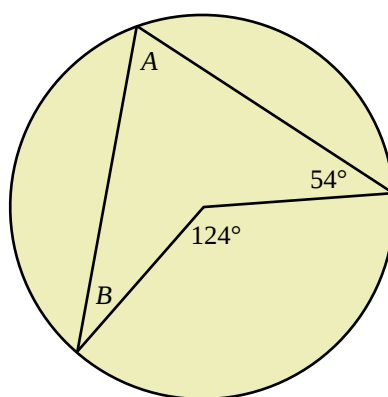
(ii) State the mode of the star rating of the *Effort at Exam Revision*.

[1 mark]

(iii) State the median of the star rating of the *Effort at Exam Revision*.

[2 marks]

Question 4



A Quadrilateral is shown with one vertex at the centre of a circle.

(i) Write down the size of angle A

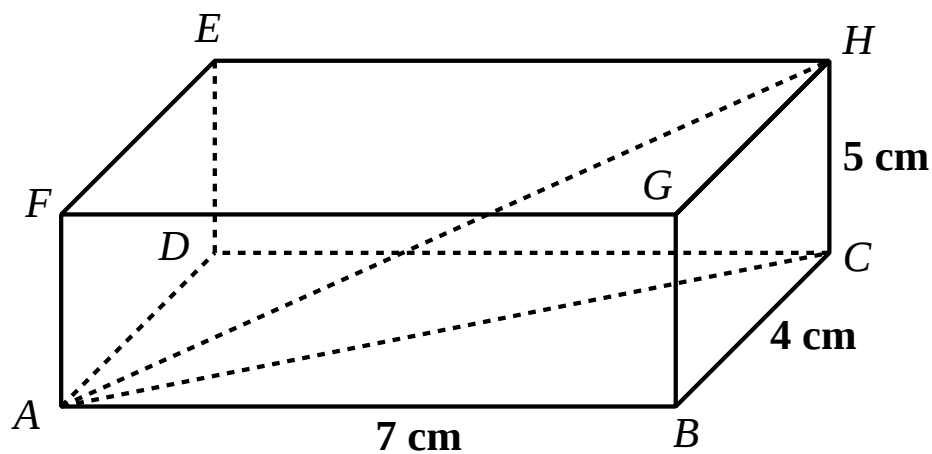
[1 mark]

(ii) Calculate the size of angle B

[2 marks]

Question 5

A cuboid $ABCDEFGH$ measures 7 cm by 4 cm by 5 cm, as shown below.



- (i) Calculate the length of the cuboid's diagonal, AH .
Give your answer accurate to 3 decimal places.

[2 marks]

- (ii) Calculate, in degrees, the angle HAC .
Give your answer accurate to 1 decimal place.

[4 marks]

Question 6

The number of commendations awarded to 4th form pupils in a week at Shrewsbury School is given in the table below.

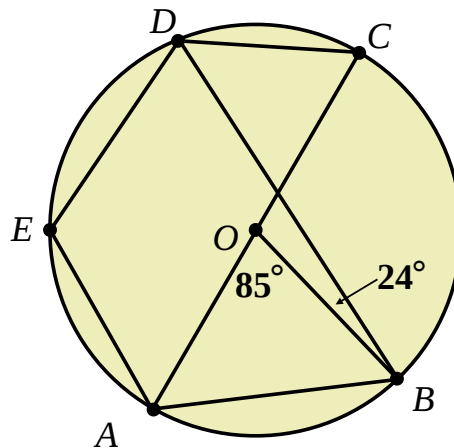
Number of Commendations	Number of Pupils		
$0 \leq x \leq 8$	60		
$9 \leq x \leq 15$	30		
$16 \leq x \leq 26$	18		
$27 \leq x \leq 45$	12		

Calculate an estimate of the mean number of commendations received by a pupil.
Give your answer correct to 3 significant figures.
Show your working.

[4 marks]

Question 7

In the diagram, A, B, C, D and E are points on the circumference of a circle centre O . Angle AOB is equal to 85° and angle DBO is equal to 24° .



Find : (i) angle OAB

[2 marks]

(ii) angle BDC

[1 mark]

(iii) angle OCD

[1 mark]

(iv) angle AED

[1 mark]

Question 8

B is directly proportional to the cube of t .

It is known that $B = 72$ when $t = 2$

(i) Find a formula for B in terms of t .

[3 marks]

(ii) Find the exact value of B when $t = 4$

[2 marks]

(iii) Find the exact value of t when $B = \frac{1}{3}$

[2 marks]

Question 9

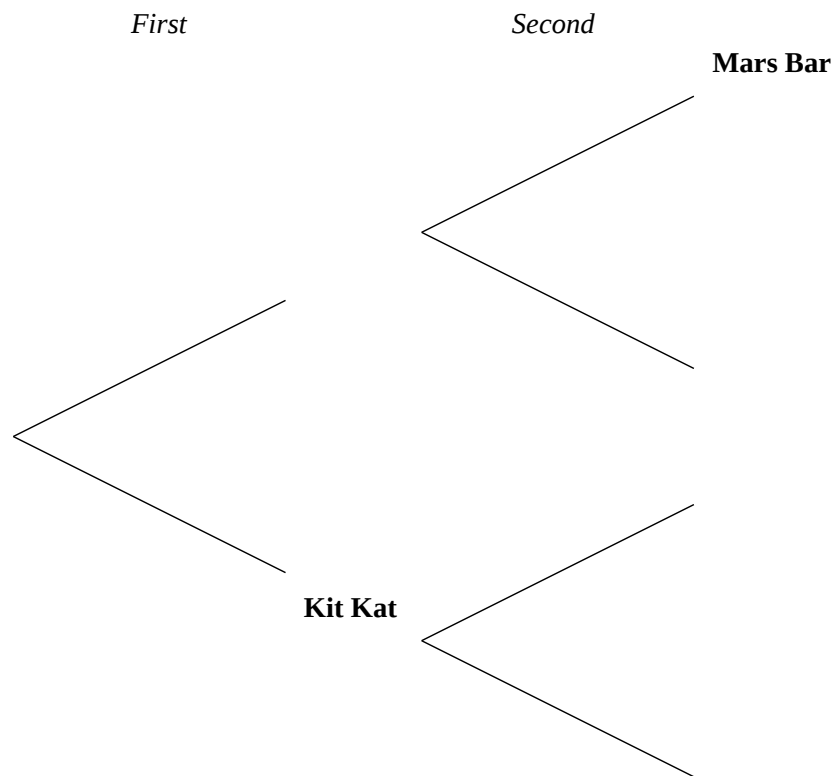
Cartman buys nine chocolate bars.

Five of them are Mars Bars; the other four are Kit Kats.

He chooses one bar at random and eats it.

He then chooses a second bar at random and eats this too.

(a) Complete the tree diagram below, including all labels and probabilities.



[2 marks]

(b) Find the exact probability that Cartman eats:

(i) two Kit Kats
(Simplify your answer)

[2 marks]

(ii) exactly one Mars Bar
(Simplify your answer)

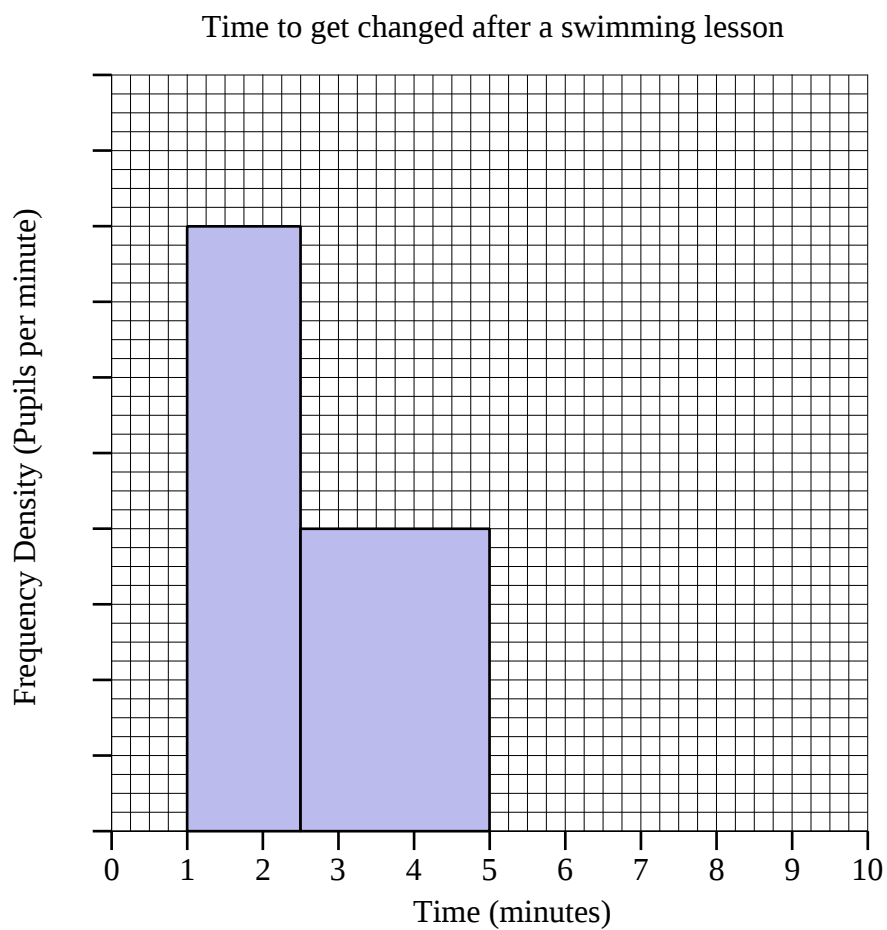
[2 marks]

Question 10

The times in minutes that some pupils take to get changed after a swimming lesson are summarised in the table and histogram below:

Time, t (minutes)	Frequency
$0 \leq t < 1$	7
$1 \leq t < 2.5$	
$2.5 \leq t < 5$	20
$5 \leq t < 9$	22

Complete the table and histogram.



[6 marks]

Question 11

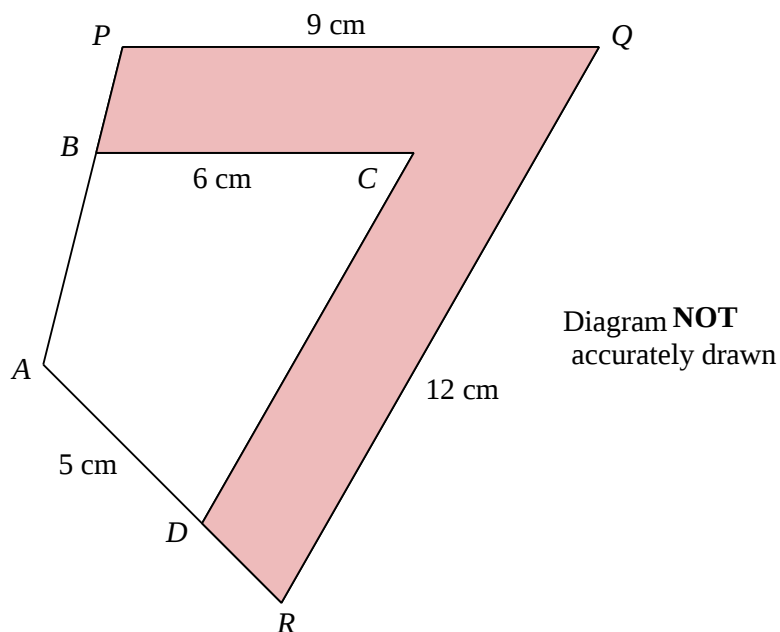
$ABCD$ and $APQR$ are two similar quadrilaterals.

$$PQ = 9 \text{ cm}$$

$$BC = 6 \text{ cm}$$

$$AD = 5 \text{ cm}$$

$$QR = 12 \text{ cm}$$



(i) Find the length of DC .

[2 marks]

(ii) Find the length of AR .

[2 marks]

The area of the quadrilateral $ABCD$ is 32 cm^2

(iii) Calculate the area of the shaded region.

[4 marks]

“Mind Your Maths” **Answers 1**

Year 10 Exam Revision

Answer 1

$$\frac{15}{25} \times 100 = 60\% \text{ are black}$$

[2 marks]

Answer 2

(i) $\frac{1}{6}$	(ii) $\frac{1}{2}$	(iii) 0	(iv) $\frac{1}{3}$
(v) $\frac{2}{3}$	(vi) 1	(vii) $\frac{2}{3}$	(viii) $\frac{1}{3}$

[8 marks]

Answer 3

(i)

Number of stars	*	**	***	****	*****
Frequency	1	8	6	3	2
Cumulative Frequency	1	9	15	18	20

[2 marks]

(ii) Two stars (The number of stars that occurs most often)

[1 mark]

(iii) $\frac{20 + 1}{2} = 10.5^{th}$ Both 10^{th} and 11^{th} are THREE STARS

[2 marks]

Answer 4

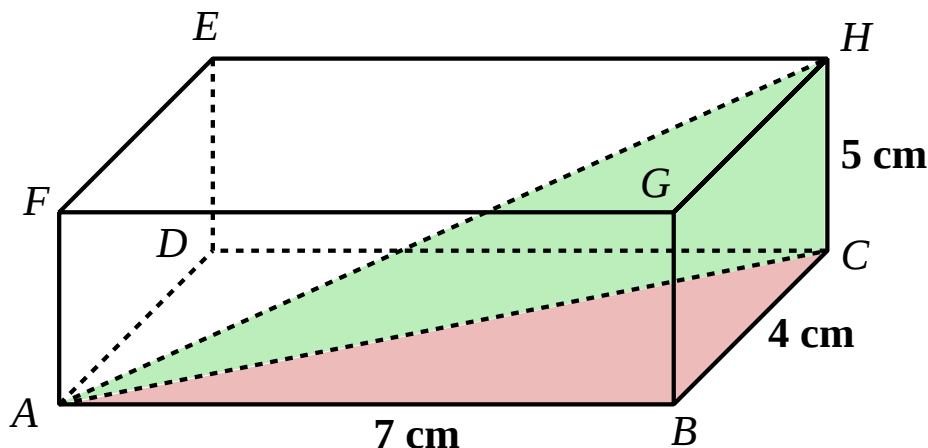
(i) $A = 62^\circ$ (Angle at circumference is half the angle at the centre)

[1 mark]

(ii) $B = 8^\circ$ (Angles in any quadrilateral sum to 360°)

[2 marks]

Answer 5



- (i) Long diagonal of box is given by 3D version of Pythagoras' Theorem.

$$AH = \sqrt{7^2 + 4^2 + 5^2}$$

$$= 9.487$$

[2 marks]

- (ii) The efficient method is to use answer (i) which is the hypotenuse of the green triangle, along with the 5 cm in the green triangle which is opposite the angle to be found at corner A in the green triangle.

$$\angle HAC = \arcsin\left(\frac{5}{9.487}\right)$$

$$= 31.8^\circ$$

[4 marks]

Answer 6

Number of Commendations	Number of Pupils	Mid-Interval Value	Contribution towards total
$0 \leq x \leq 8$	60	4	240
$9 \leq x \leq 15$	30	12	360
$16 \leq x \leq 26$	18	21	378
$27 \leq x \leq 45$	12	36	432
	120	<= Totals =>	1410

$$\text{Mean} = \frac{1410}{120}$$

$$= 11.8 \text{ commendations per pupil}$$

[4 marks]

Answer 7

- (i) $\angle OAB = 47.5^\circ$ (ii) $\angle BDC = 47.5^\circ$
 (iii) $\angle OCD = 71.5^\circ$ (iv) $\angle AED = 108.5^\circ$

[2, 1, 1, 1 marks]

Answer 8

(i) $B = k t^3$

$$72 = k \times 2^3$$

$$k = \frac{72}{8}$$

$$= 9 \text{ and so the formula is } B = 9 t^3$$

[3 marks]

(ii) When $t = 4$, $B = 9 \times 4^3$

$$B = 576$$

[2 marks]

(iii) When $B = \frac{1}{3}$ we have, $\frac{1}{3} = 9 \times t^3$

$$t^3 = \frac{1}{27}$$

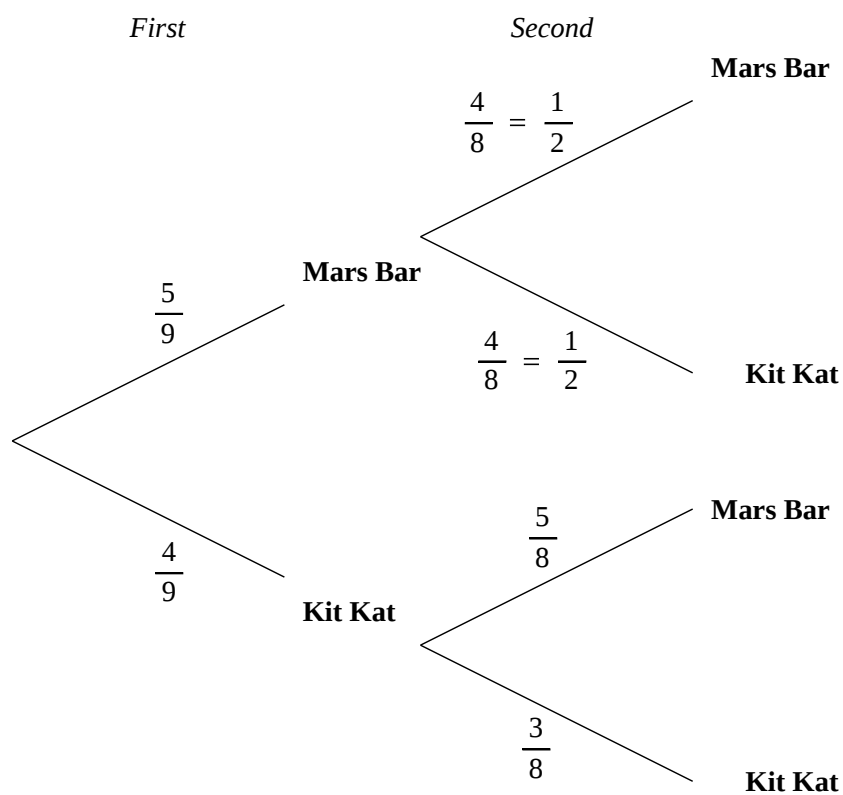
$$t = \sqrt[3]{\frac{1}{27}}$$

$$t = \frac{1}{3}$$

[2 marks]

Answer 9

(a)



[2 marks]

(b) (i) $p(\text{Kit Kat, Kit Kat}) = \frac{4}{9} \times \frac{3}{8} = \frac{1}{6}$

[2 marks]

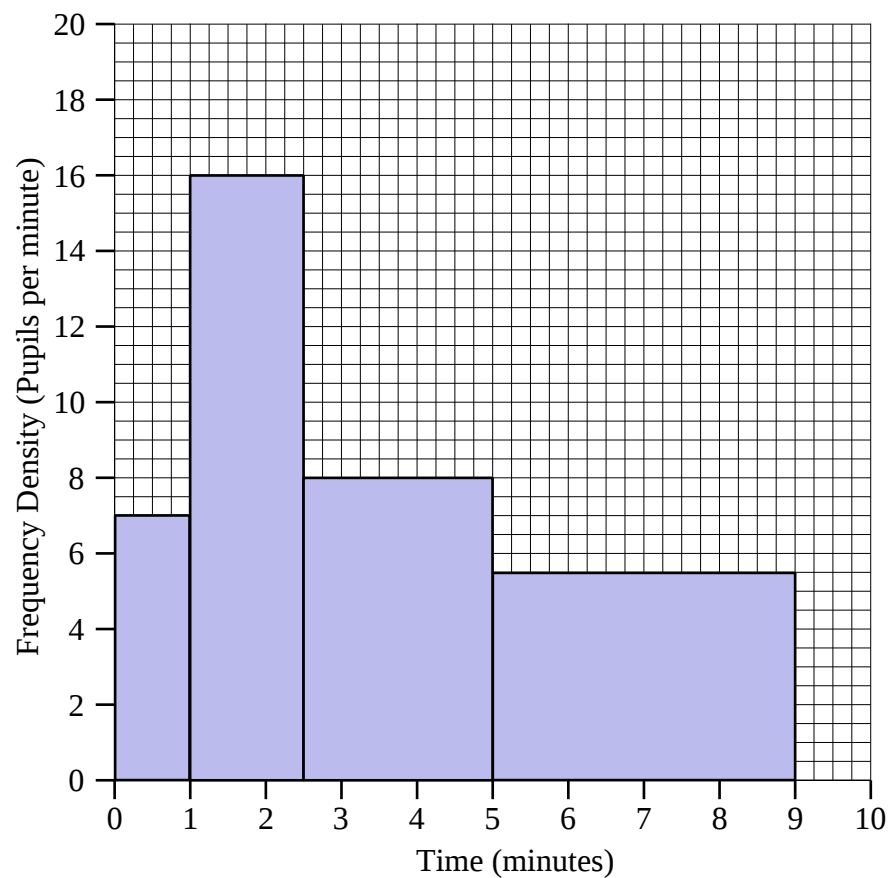
(ii) $p(\text{Mars Bar, Kit Kat}) + p(\text{Kit Kat, Mars Bar})$
 $= \frac{5}{9} \times \frac{4}{8} + \frac{4}{9} \times \frac{5}{8}$
 $= \frac{5}{9}$

[2 marks]

Answer 10

Time, t (minutes)	Frequency
$0 \leq t < 1$	7
$1 \leq t < 2.5$	24
$2.5 \leq t < 5$	20
$5 \leq t < 9$	22

Time to get changed after a swimming lesson



[6 marks]

Answer 11

- (i) The Length Scale Factor (LSF) going big to small is “6 from 9”

$$LSF = \frac{6}{9} = \frac{2}{3}$$

$$\begin{aligned}\therefore DC &= \frac{2}{3} \times 12 \\ &= 8 \text{ cm}\end{aligned}$$

[2 marks]

- (ii) $AR = 5 \times \frac{3}{2} = 7.5 \text{ cm}$

[2 marks]

- (iii) Area Scale Factor (ASF) going small to big is,

$$ASF = (LSF)^2$$

$$= \left(\frac{3}{2} \right)^2$$

$$= \frac{9}{4}$$

$$\text{Area of } APQR = \frac{9}{4} \times 32$$

$$= 72 \text{ cm}^2$$

$$\text{Area Shaded} = \text{Area } APQR - \text{Area } ABCD$$

$$= 72 - 32$$

$$= 40 \text{ cm}^2$$

[4 marks]

“Mind Your Maths” **Number 2**

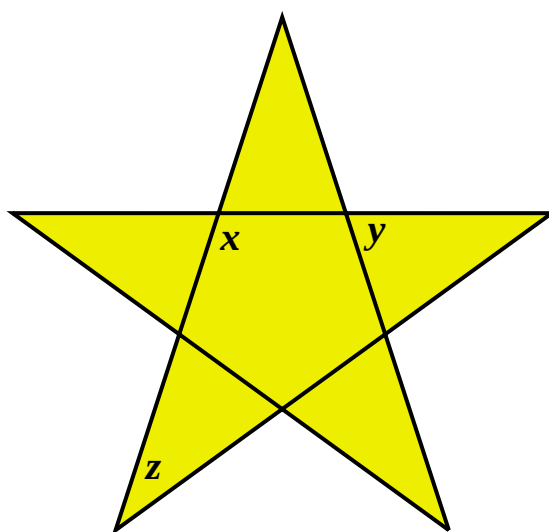
Year 10 Exam Revision

You may use a calculator

Marks Available : 60

Question 1

A five pointed star with rotational symmetry of order five is shown below;



(a) Which one of the following is the name of this shape ?

- Is it a (i) Pentagram
 (ii) Hexagram
 or (iii) Octogram ?

[1 mark]

(b) Calculate the size of ;

(i) angle x

[1 mark]

(ii) angle y

[1 mark]

(iii) angle z

[1 mark]

Question 2

A total of £108 is to be divided in the ratio 4 : 3 : 2 for Amy, Bob and Charles.
Calculate how much money each receives.

Amy _____

Bob _____

Charles _____

[2 marks]

Question 3

Expand the brackets and simplify;

(i) $(x + 11)(x + 7)$

[2 marks]

(ii) $(x - 15)(x + 3)$

[2 marks]

(iii) $(x - 8)^2$

[2 marks]

(iv) $(4x + 9)(3x - 5)$

[3 marks]

Question 4

Terry and June are given money in the ratio 6 : 7 respectively.

Terry receives £39.

How much does June receive ?

[2 marks]

Question 5

Factorise fully each of the following,

(i) $x^2 + 4x - 77$

[2 marks]

(ii) $x^2 - 5x + 4$

[2 marks]

Question 6

Solve each of the following equations by first factorising the quadratics.
You must show sufficient working to make your method clear.

(i) $x^2 + 10x + 16 = 0$

[2 marks]

(ii) $x^2 - 8x - 33 = 0$

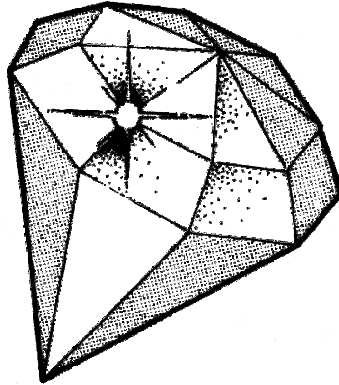
[2 marks]

Question 7

Mr Sparkle has decided to buy Mrs Sparkle a Wedding Anniversary present.
Via subtle hints from Mrs Sparkle, he knows that she likes diamonds.

The value, V , of a diamond is **directly** proportional to the **square** of its weight W .

In other words, $V = k W^2$ for some constant k that is to be found.



- (i) Use the fact that a diamond weighing 10 grams is worth £200 to help you write down a formula that relates the value of a diamond to its cost.

[2 marks]

- (ii) Show how you would use your part (i) formula to determine the value of a diamond weighing 30 grams.

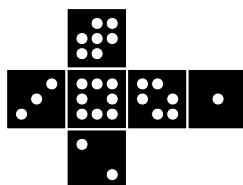
[2 marks]

- (iii) Mr Sparkle decide to spend £5000.
What is the weight of the diamond that Mrs Sparkle can look forward to receiving on the day of the Anniversary?

[2 marks]

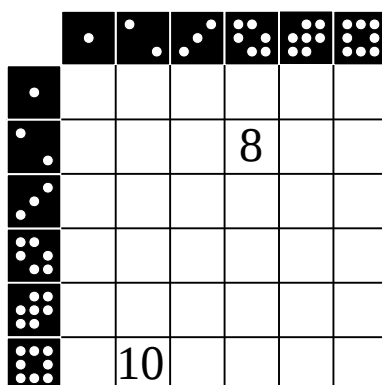
Question 8

The net of a *Lucky-Strike Dice*TM is shown :



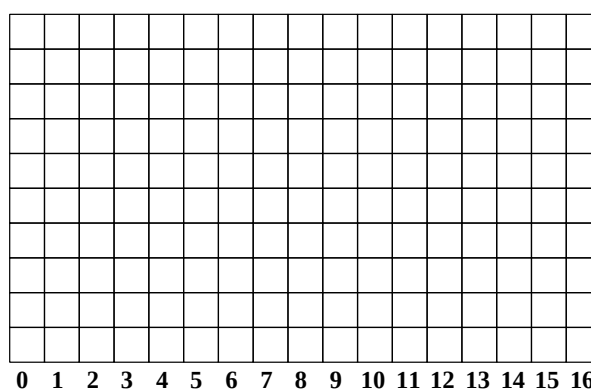
One orange and one blue *Lucky-Strike Dice*TM are rolled.
The number of pips showing are added together.

(a) Show the thirty-six possible results on this possibility state space diagram,



[2 marks]

(b) Plot a bar chart of the probabilities.



[1 mark]

(c) (i) Which score occurs most often ?

[1 mark]

(ii) Of the possible scores rolled, which are least likely ?

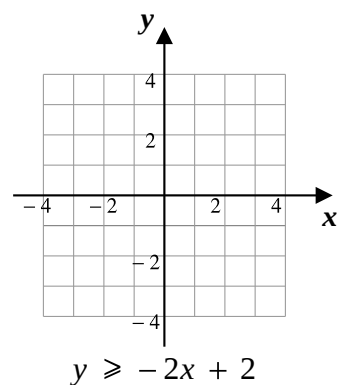
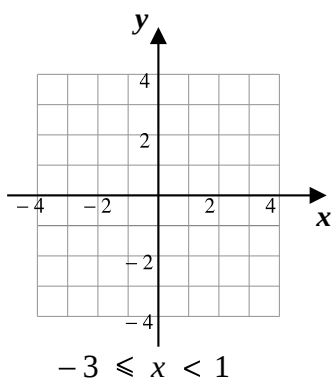
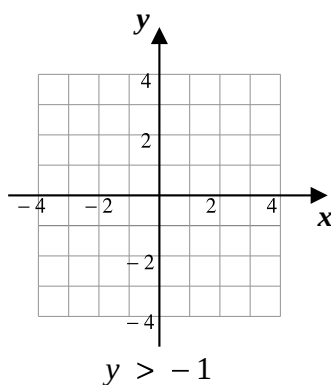
[1 mark]

(iii) What is the probability of rolling an odd number ?

[1 mark]

Question 9

On each graph use shading to draw the inequality specified.
Mark clearly the region wanted with the letter **R**



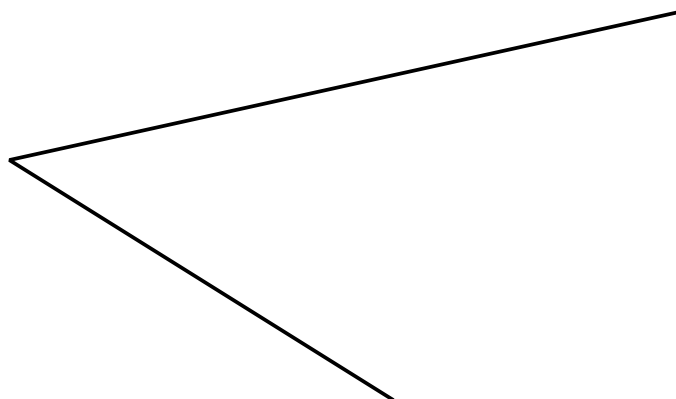
[6 marks]

Question 10

(i) What does the word **bisect** mean ?

[1 mark]

(ii) Use a compass and a straight edge to bisect the angle drawn below.
You must show all your construction lines.



[3 marks]

Question 11

Simplify the following expression fully

$$7 (3x + y) - 5 (x - 2y)$$

[2 marks]

Question 12

Eleven gerbils were timed to see how long, in seconds, they took to complete a maze.
Their times were as follows

6	13	8	8	7	19
9	6	14	11	6	

- (i) What is the mode of the times ?

[1 mark]

- (ii) Find the median time.

[2 marks]

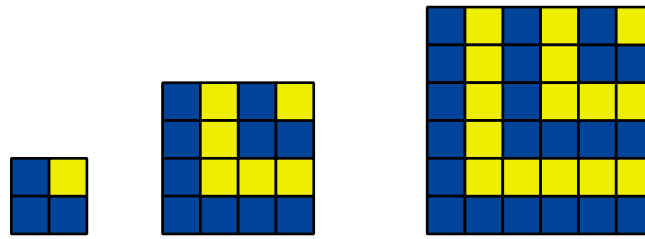
- (iii) Calculate the interquartile range of the times.

[2 marks]

- (iv) Calculate the mean time taken to complete the maze.

[2 marks]

Question 13



In the first of the above sequence of diagrams the ratio of
blue squares : yellow squares
is $3 : 1$

- (i) What is the ratio of blue squares : yellow squares in the second diagram ?

[1 mark]

- (ii) What is the ratio of blue squares : yellow squares in the the third diagram ?

[1 mark]

- (iii) By spotting a connection between the numbers in these ratios and the sequence of triangular numbers, or otherwise, write down the ratios of blue squares : yellow squares for the next three diagrams in the sequence.

[2 marks]

“Mind Your Maths” **Answers 2**

Year 10 Exam Revision

Answer 1

(a) It's option (i), a pentagram.

[1 mark]

(b) (i) $x = 108^\circ$

(ii) $y = 72^\circ$

(iii) $z = 36^\circ$

[3 marks]

Answer 2

Each part is worth $\frac{108}{9} = \text{£}12 \Rightarrow \text{£}48 : \text{£}36 : \text{£}24$

Amy gets £48

Bob gets £36

Charles gets £24

[2 marks]

Answer 3

(i) $x^2 + 18x + 77$

(ii) $x^2 - 12x - 45$

(iii) $x^2 - 16x + 64$

(iv) $12x^2 + 7x - 45$

[2, 2, 2, 3 marks]

Answer 4

June receives £45.50

[2 marks]

Answer 5

(i) $(x + 11)(x - 7)$

(ii) $(x - 4)(x - 1)$

[4 marks]

Answer 6

(i) $x^2 + 10x + 16 = 0$

(ii) $x^2 - 8x - 33 = 0$

$(x + 8)(x + 2) = 0$

$(x - 11)(x + 3) = 0$

Either $x + 8 = 0$ or $x + 2 = 0$

Either $x - 11 = 0$ or $x + 3 = 0$

$x = -8, x = -2$

$x = 11, x = -3$

Answer 7

(i) $V = 2W^2$

(ii) $V = 2 \times 30^2 \therefore V = \text{£}1800$

(iii) 50 grams

[6 marks]

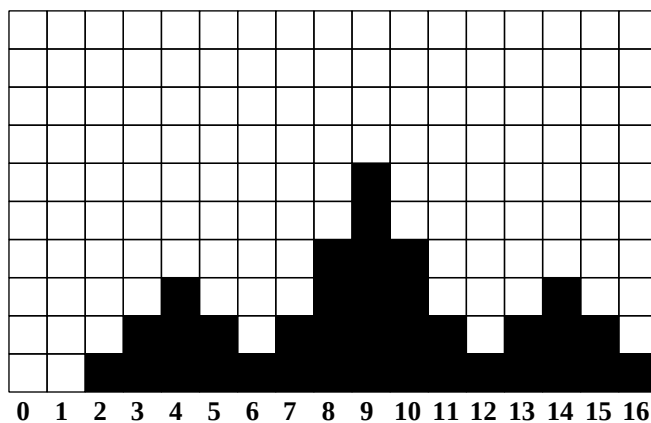
Answer 8

(a)

		•	•	•	•	•
•	2	3	4	7	8	9
•	3	4	5	8	9	10
•	4	5	6	9	10	11
•	7	8	9	12	13	14
•	8	9	10	13	14	15
•	9	10	11	14	15	16

[2 marks]

(b)

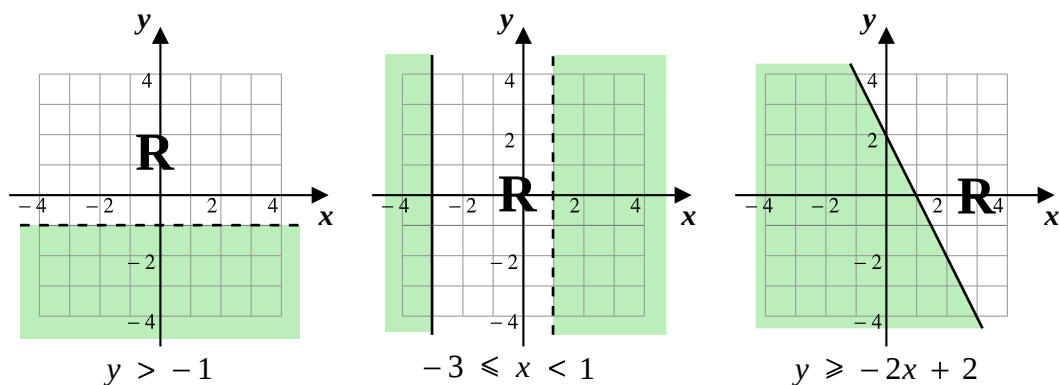


[1 marks]

- (c) (i) 9
 (ii) 2, 6, 12, 16
 (iii) 0.5

[3 marks]

Answer 9



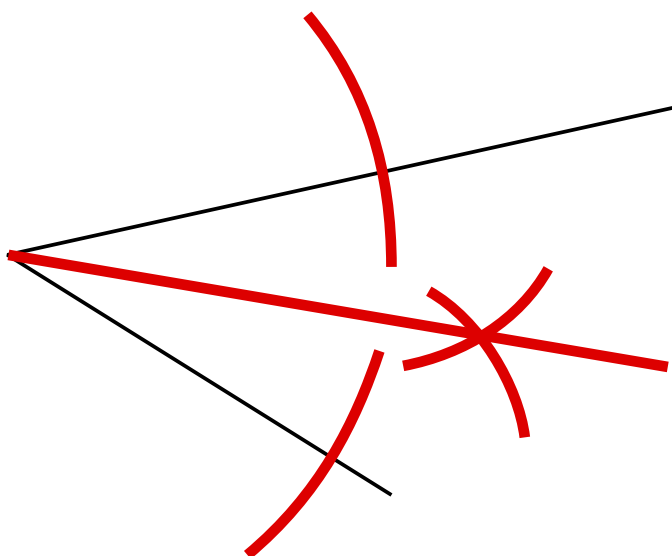
[6 marks]

Answer 10

(i) Cut in half, divide in two equal parts.

[1 mark]

(ii) Construction lines that evidence correct method used.



[3 marks]

Answer 11

$$\begin{aligned}
 & 7(3x + y) - 5(x - 2y) \\
 &= 21x + 7y - 5x + 10y \\
 &= 16x + 17y
 \end{aligned}$$

[2 marks]

Answer 12

At some stage the data needs putting in order...

6	6	6	7	8	8
9	11	13	14	19	

(i) mode = 6 seconds

(ii) median = 8 seconds

(iii) $13 - 6 = 7$ seconds

(iv) mean = 9.7 seconds

[1, 2, 2, 2 marks]

Answer 13

(i) 10 : 6 (or 5 : 3) Δ N°s 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78

(ii) 21 : 15 (or 7 : 5)

(iii) 36 : 28 (or 9 : 7)

55 : 45 (or 11 : 9)

78 : 66 (or 13 : 11)

[1, 1, 2 marks]

“Mind Your Maths” Number 3

Year 10 Exam Revision

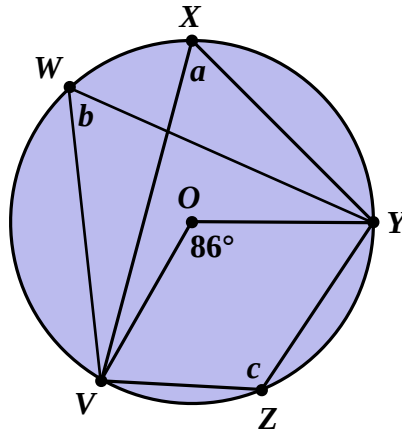
You may use a calculator

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) $4x - 10 \geq 6$

[1, 2 marks]

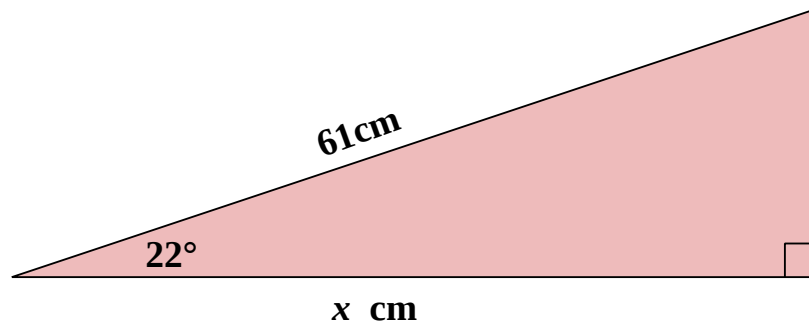
(iii) $3x + 5 > x + 11$

(iv) $5(x + 4) \leq 3(x + 7)$

[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]

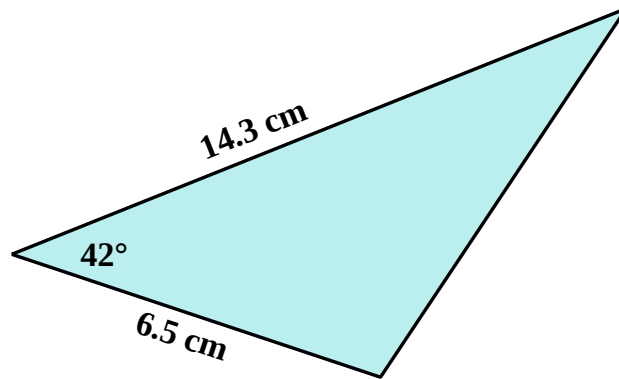
(ii) $E = mc^2$

[2 marks]

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

[2 marks]

Question 5



- (a) Use the formula $\text{Area } \Delta = \frac{1}{2} ab \sin C$ 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]

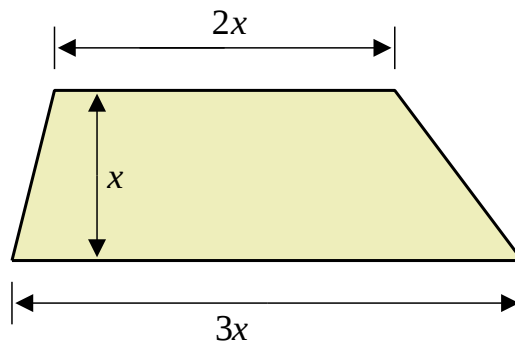
Question 7

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.

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

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, $(5 - 3\sqrt{2})(5 + 4\sqrt{2})$

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]

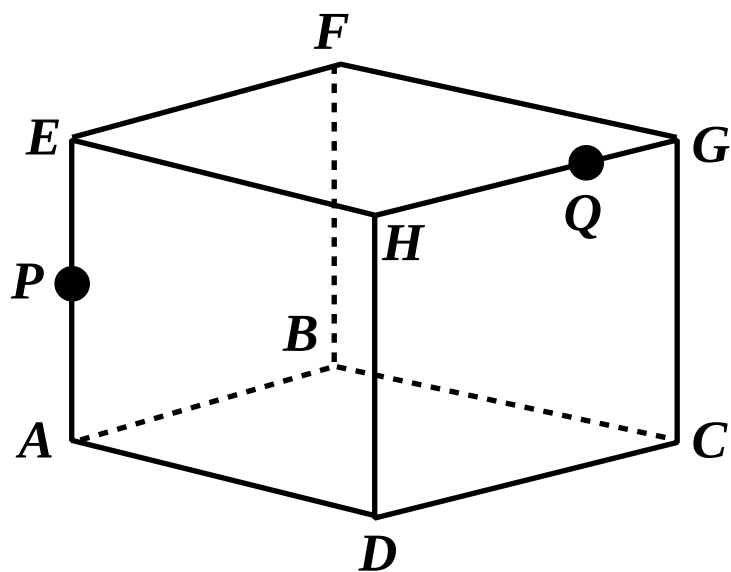
- (ii) Standing on top of cliffs, I can see a distance of 35 km.
Use your part (i) answer to determine the height of the cliffs.

[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]

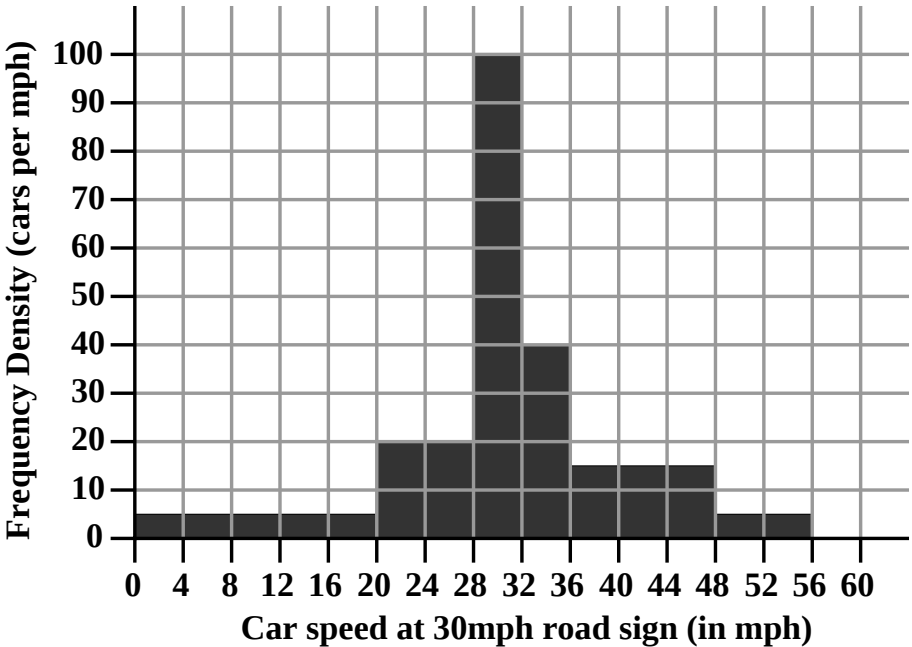
(iv) the angle QDP

[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.

A histogram to show the distribution of car speeds at a 30mph road sign



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

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

[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;

$$4x + 9y = 5$$

$$6x - 15y = -2$$

[4 marks]

“Mind Your Maths” **Answers 3**

Year 10 Exam Revision

Answer 1

(i) $a = 43^\circ$ (ii) $b = 43^\circ$ (iii) $c = 137^\circ$

[3 marks]

Answer 2

(i) $x < 18$

(ii) $x \geq 4$

(iii) $x > 3$

(iv) $x \leq \frac{1}{2}$

[1, 2, 2, 3 marks]

Answer 3

$x = 61 \cos 22 \therefore x = 56.6^\circ$

[3 marks]

Answer 4

(i) $c = y - mx$

(ii) $c = \sqrt{\frac{E}{m}}$

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

[1, 2, 2 marks]

Answer 5

(i)
$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} ab \sin C \\ &= \frac{1}{2} \times 6.5 \times 14.3 \times \sin 42 \\ &= 31.1 \text{ cm}^2 \end{aligned}$$

[2 marks]

(ii)
$$\begin{aligned} c^2 &= a^2 + b^2 - 2ab \cos C \\ &= 6.5^2 + 14.3^2 - 2 \times 6.5 \times 14.3 \times \cos 42 \\ &= 108.59 \\ &= 10.4 \text{ cm} \end{aligned}$$

[3 marks]

Answer 6

$420\,000 \times 1.12 = \text{£}470\,400$

[2 marks]

Answer 7

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

$$1000 = \frac{1}{2} (2x + 3x) x$$

$$1000 \times 2 = 5x^2$$

$$x^2 = 400$$

$$x = 20 \text{ cm}$$

[4 marks]

Answer 8

$$\begin{aligned} (5 - 3\sqrt{2})(5 + 4\sqrt{2}) &= 25 + 20\sqrt{2} - 15\sqrt{2} - 24 \\ &= 1 + 5\sqrt{2} \end{aligned}$$

That is, $a = 1$ and $b = 5$

[3 marks]

Answer 9

(i) $d = k\sqrt{h}$

$$10 = k\sqrt{4} \quad \Rightarrow k = 5 \text{ and the formula is } d = 5\sqrt{h}$$

[3 marks]

(ii) $d = 5\sqrt{h}$

$$35 = 5\sqrt{h}$$

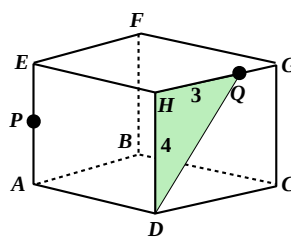
$$\sqrt{h} = 7$$

$$h = 49 \text{ metres}$$

[2 marks]

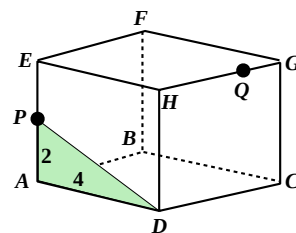
Answer 10

(i) $DQ = \sqrt{3^2 + 4^2} = 5 \text{ cm}$



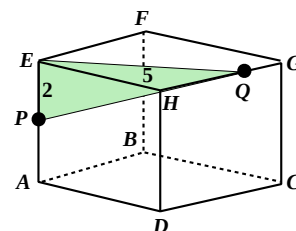
[2 marks]

(ii) $PD = \sqrt{2^2 + 4^2} = \sqrt{20} = 4.47 \text{ cm}$



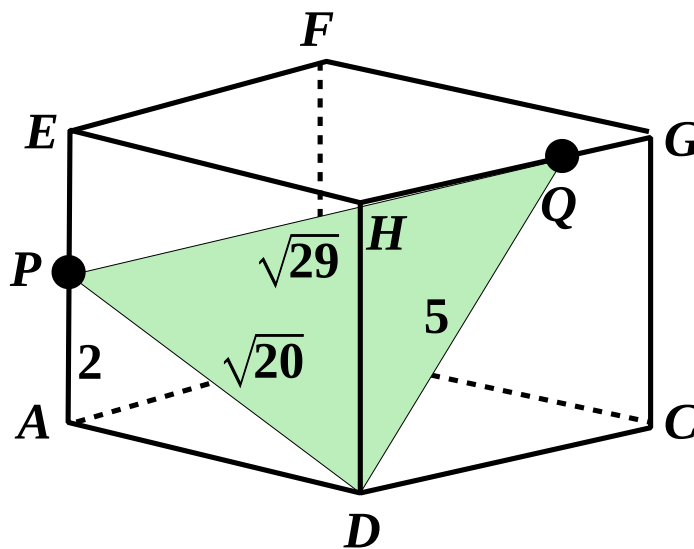
[3 marks]

(iii) $PQ = \sqrt{2^2 + 5^2} = \sqrt{29} = 5.39 \text{ cm}$



[3 marks]

(iv)



$$\cos D = \frac{p^2 + q^2 - d^2}{2pq} \quad (\text{The cosine rule reversed})$$

$$\begin{aligned} \cos QDP &= \frac{25 + 20 - 29}{2 \times 5 \times \sqrt{20}} \\ &= 0.358 \end{aligned}$$

$$\therefore \angle QDP = 69^\circ$$

[4 marks]

Answer 11**(i)**

Car speed (miles per hour, mph)	Number of cars Frequency = Area	Width	Height
$0 \leq m < 20$	100	20	5
$20 \leq m < 28$	160	8	20
$28 \leq m < 32$	400	4	100
$32 \leq m < 36$	160	4	40
$36 \leq m < 48$	180	12	15
$48 \leq m < 56$	40	8	5

[3 marks]**(ii)** 1040 cars**[1 mark]****(iii)** $\frac{400}{1040} \times 100 = 38.5 \%$ **[2 marks]****Answer 12**

$$4x + 9y = 5 \Rightarrow \times 3 \Rightarrow 12x + 27y = 15$$

$$6x - 15y = -2 \Rightarrow \times 2 \Rightarrow 12x - 30y = -4$$

$$57y = 19$$

$$y = \frac{1}{3}$$

Use y to find x , $4x + 9y = 5$

$$4x + 3 = 5$$

$$4x = 2$$

$$x = \frac{1}{2}$$

[4 marks]

“Mind Your Maths” **Number 4**

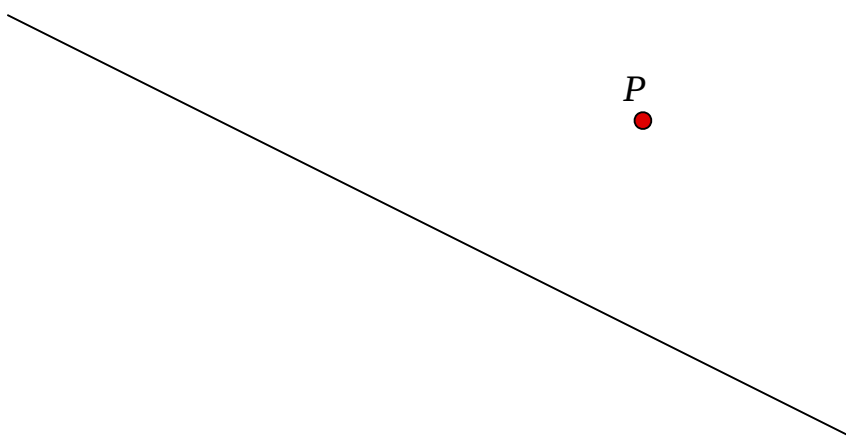
Year 10 Exam Revision

You may use a calculator

Marks Available : 60

Question 1

Using a ruler and pair of compasses construct a perpendicular to the line below which passes through point P . You must show all your construction lines.



[3 marks]

Question 2

$$f(x) = x^2 + 1, \quad x \in \mathbb{R}$$

$$g(x) = \frac{1}{x - 3}, \quad x \in \mathbb{R}, x \neq 3$$

- (i) Explain why function g has the number 3 excluded from its domain.

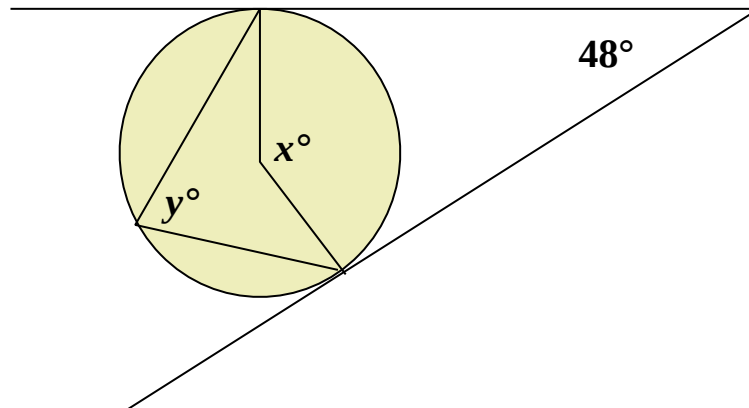
[1 mark]

- (ii) Find the value of $fg(5)$

[3 marks]

Question 3

Two lines, tangential to a circle, meet in an angle of 48° .



- (i) State the size of angle x .

[2 marks]

- (ii) State the size of angle y .

[2 marks]

Question 4

- (i) A remote controlled kettle normally costs £640.
In a sale, the price is reduced by 30%.
What is the sale price of the kettle ?

[2 marks]

- (ii) A wind up radio is on sale for £28.70, having already been reduced by 30%.
What is the normal cost of the radio ?

[2 marks]

Question 5

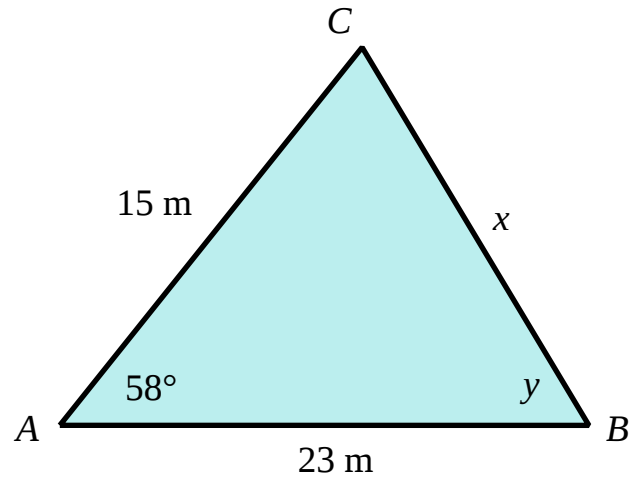
For your information in $\triangle ABC$ with sides of length a , b and c .

The cosine rule : $c^2 = a^2 + b^2 - 2ab \cos C$

The sine rule : $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

The diagram shows a triangle ABC .



(i) Calculate, correct to one decimal place, the distance x .

[3 marks]

(ii) Calculate, correct to one decimal place, the angle y .

[3 marks]

(iii) Calculate, to the nearest integer, the area of the triangle.

[2 marks]

Question 6

A fair die with the numbers 1 to 6 is rolled once.

A fair spinner with the numbers 2, 3 and 5 is also spun once.

The **positive** difference between the numbers is recorded.

- (i) Complete this table of possible outcomes.

		Die					
		1	2	3	4	5	6
Spinner	2			1			
	3						
	5	4					

[2 marks]

- (ii) What is the probability of obtaining a difference of 1?

[2 marks]

- (iii) What is the probability of obtaining a “5” on the die or spinner (or both)?

[2 marks]

Question 7

Two similar solids have heights of 24 cm and 36 cm.

- (i) The smaller solid has a width of 9 cm.
Calculate the width of the larger solid.

[2 marks]

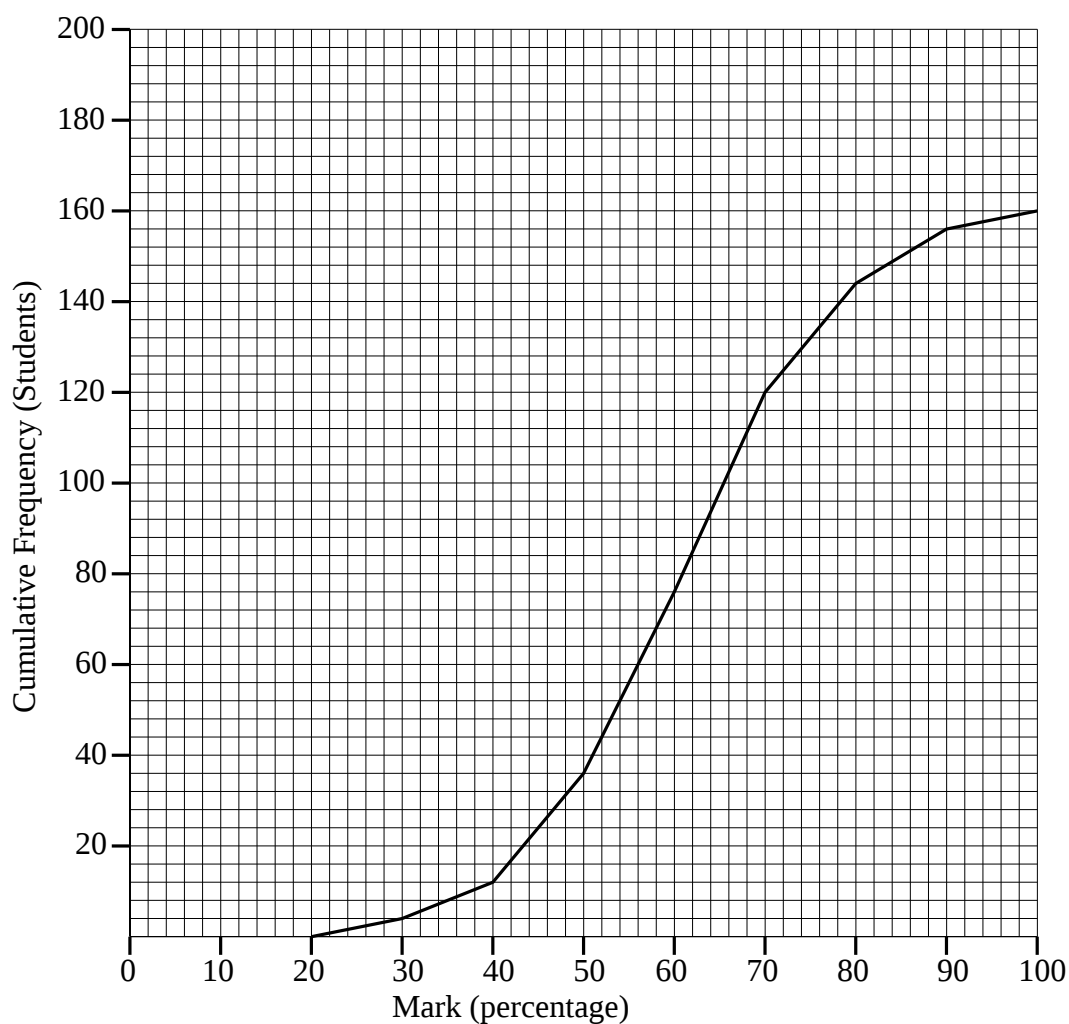
- (ii) The volume of the larger solid is 9477 cm^3 .
Calculate the volume of the smaller solid.

[3 marks]

Question 8

A cumulative frequency diagram is presented below.

It concerns the scores in an Archery Competition by a group of 160 students.



- (i) Roughly how many students scored over 80% in the competition ?

[2 marks]

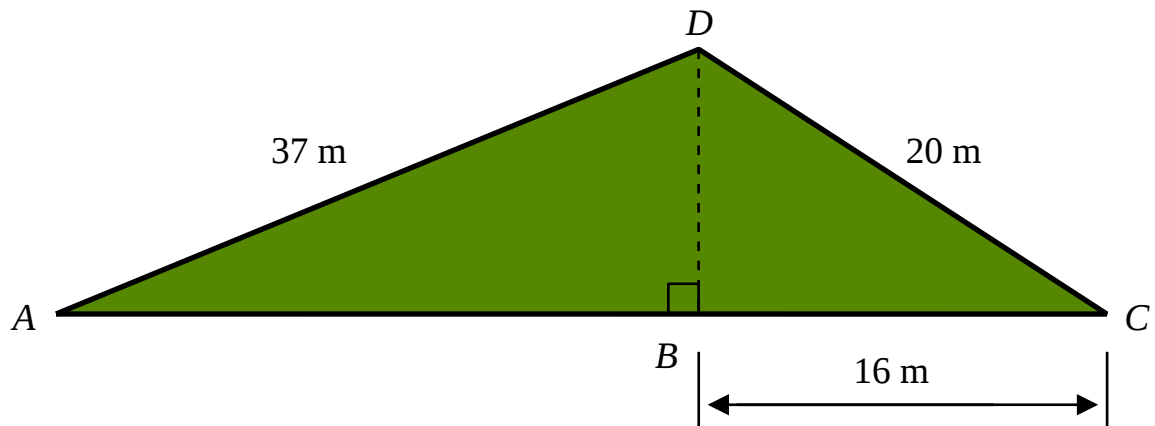
- (ii) Use the graph to estimate the interquartile range of the marks.
Leave evidence on the graph that demonstrates you did indeed use the graph.

[3 marks]

Question 9

The diagram below shows a triangular lawn ADC .

A fence DB runs across the lawn, meeting the edge AC at right angles.



- (i) Calculate the length AC .

[5 marks]

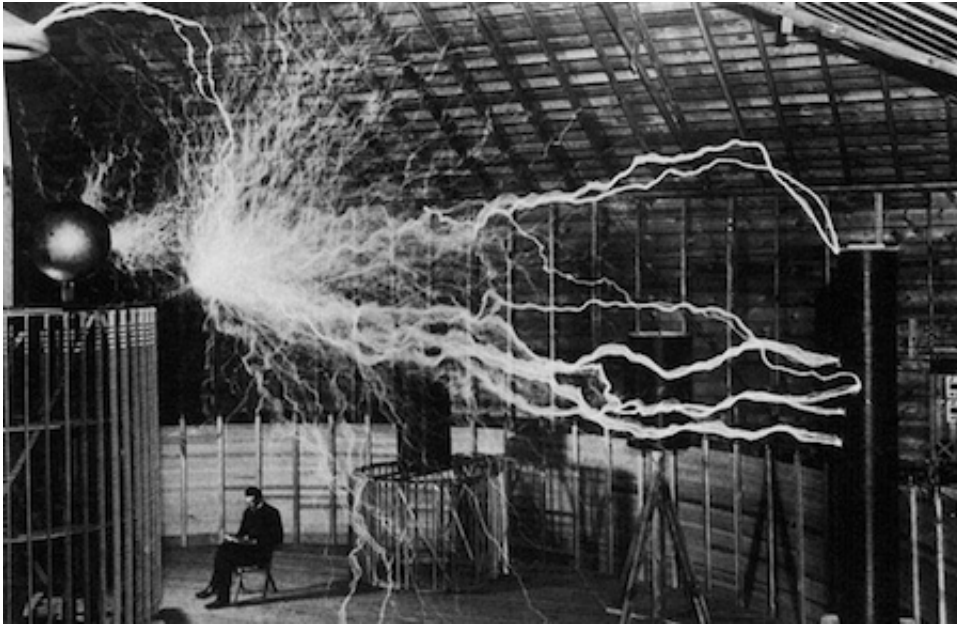
- (ii) Find the area of the lawn, giving the correct units in your answer.

[2 marks]

- (iii) Calculate the angle BCD , correct to 1 decimal place.

[2 marks]

Question 10



The Physicist, Nikola Tesla, conducting his famous high voltage experiments in his laboratory in Colorado Springs, USA, 1899.

In the physics of electrostatics, the electric field strength E is inversely proportional to the cube of the distance, d , from a highly charged electric dipole.
It is known that $E = 75$ volt per metre when $d = 2$ metres.

(i) Find a formula for E in terms of d for this dipole.

[3 marks]

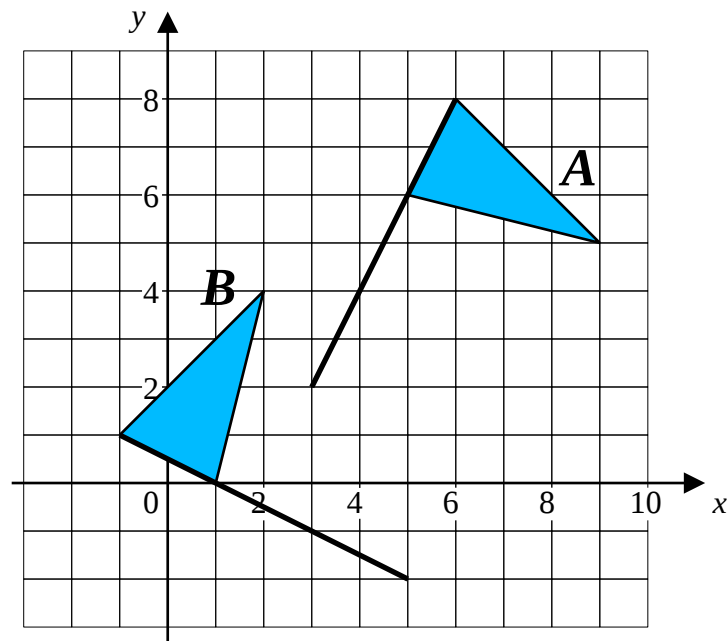
(ii) Find the exact value of E when $d = 4$.

[2 marks]

(iii) Find the value of d when $E = 0.4$
Give your answer to 3 significant figures.

[2 marks]

Question 11



- (i) Translate flag *B* by the vector $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$
Label your translated flag, *X*.

[2 marks]

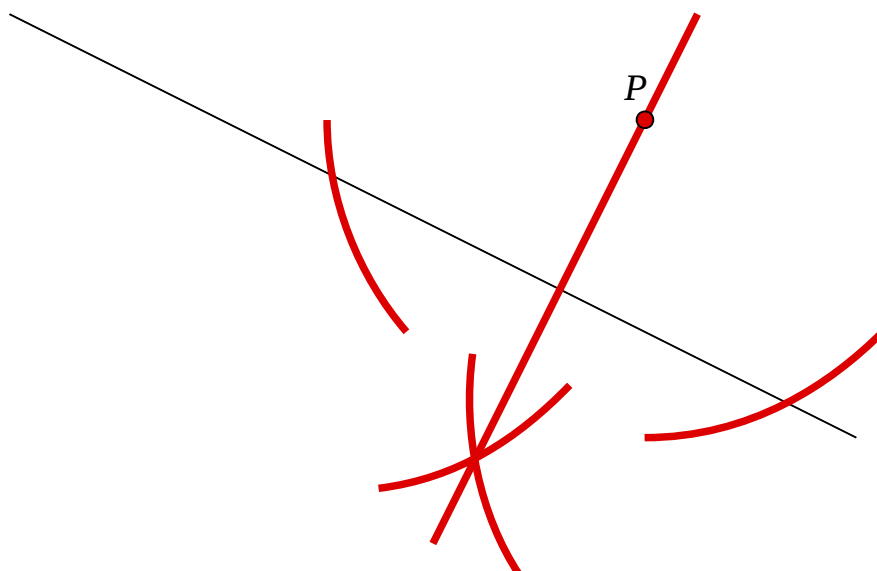
- (ii) Find a single transformation that will move flag *A* on top of flag *B*.

[3 marks]

“Mind Your Maths” **Answers 4**

Year 10 Exam Revision

Answer 1



[3 marks]

Answer 2

- (i) If the number 3 were allowed into function g a division by zero would result.
Division by zero has no meaning in mathematics.

[1 mark]

(ii)
$$\begin{aligned} fg(5) &= f\left(\frac{1}{2}\right) \\ &= \left(\frac{1}{2}\right)^2 + 1 \\ &= \frac{5}{4} \end{aligned}$$

[3 marks]

Answer 3

- (i) $x = 132^\circ$ (ii) $y = 66^\circ$

[2, 2 marks]

Answer 4

- (i) $0.7 \times £640 = £448$

[2 marks]

- (ii) $x \times 0.7 = 28.70 \quad \therefore x = £41$

[2 marks]

Answer 5**(i)** Use the cosine rule,

$$\begin{aligned}
 x^2 &= 15^2 + 23^2 - 2 \times 15 \times 23 \times \cos 58 \\
 &= 388.4 \\
 x &= 19.7 \text{ m}
 \end{aligned}$$

[3 marks]**(ii)** Use either the reversed cosine rule or the upside down sine rule,

$$\begin{aligned}
 \frac{\sin y}{15} &= \frac{\sin 58}{19.7} \\
 \sin y &= \frac{15 \times \sin 58}{19.7} \\
 &= 0.6457 \\
 y &= \arcsin 0.6457 \\
 &= 40.2^\circ
 \end{aligned}$$

[3 marks]**(iii)**

$$\begin{aligned}
 \text{Area } \Delta &= \frac{1}{2} \times 15 \times 23 \times \sin 58 \\
 &= 146 \text{ m}^2
 \end{aligned}$$

[2 marks]**Answer 6****(i)**

		Die					
		1	2	3	4	5	6
Spinner	2	1	0	1	2	3	4
	3	2	1	0	1	2	3
	5	4	3	2	1	0	1

[2 marks]

(ii) $\frac{6}{18} = \frac{1}{3}$

(iii) $\frac{8}{18} = \frac{4}{9}$

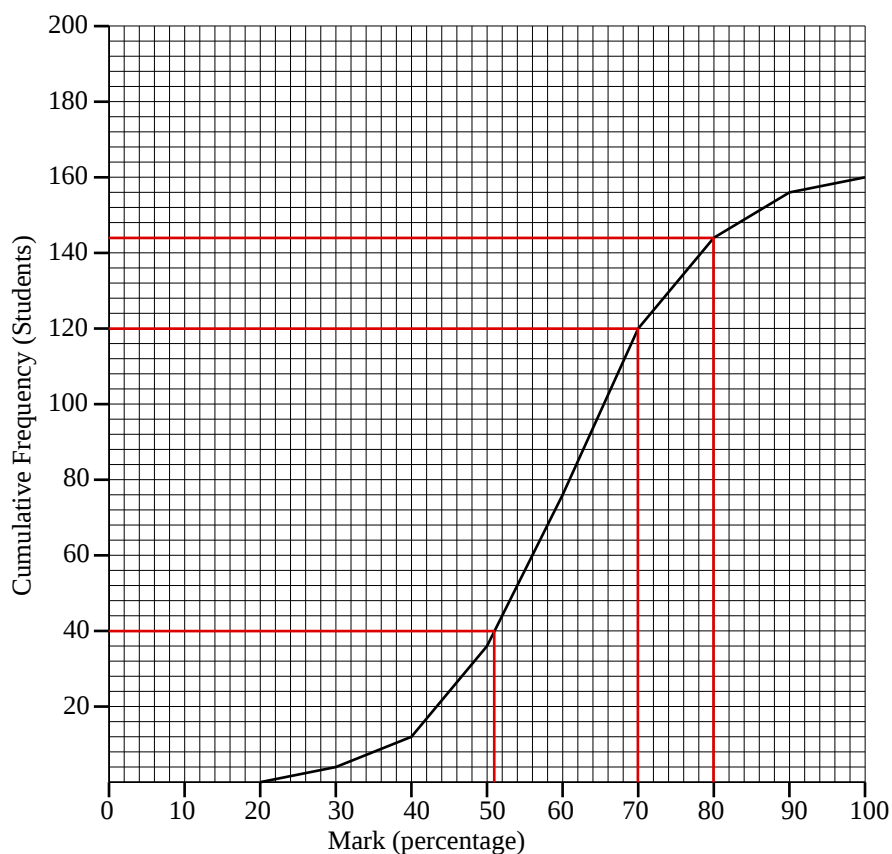
[2, 2 marks]

Answer 7

$$(i) \quad LSF = \frac{36}{24} = \frac{3}{2} \quad \text{width (larger)} = 9 \times \frac{3}{2} = 13.5 \text{ cm}$$

[2 marks]

$$(ii) \quad VSF = \left(\frac{3}{2}\right)^3 = \frac{27}{8} \quad \text{volume (smaller)} = 9477 \times \frac{8}{27} = 2808 \text{ cm}^3$$

[3 marks]**Answer 8**

$$(i) \quad 160 - 144 = 16 \text{ students}$$

Accept $14 \leq \text{Ans} \leq 20$ **[2 marks]**

(ii) There needs to be lines drawn on the graph, such as those in red on the graph above from 40 and 120 on the Cumulative Frequency axis.

$$IQR = 70 - 51$$

$$= 19 \text{ students}$$

Accept $16 \leq \text{Ans} \leq 24$ **[3 marks]**

Answer 9

$$(i) \quad \left| \overrightarrow{BD} \right| = \sqrt{20^2 - 16^2} \quad (\text{Pythagoras' Theorem})$$

$$= 12 \text{ metres}$$

$$\left| \overrightarrow{AB} \right| = \sqrt{37^2 - 12^2} \quad (\text{Pythagoras' Theorem})$$

$$= 35 \text{ metres}$$

$$\therefore \left| \overrightarrow{AC} \right| = 35 + 16$$

$$= 51 \text{ metres}$$

[5 marks]

$$(ii) \quad \text{Area} = \frac{1}{2} \times 51 \times 12$$

$$= 306 \text{ m}^2$$

[2 marks]

$$(iii) \quad \angle BCD = \arcsin\left(\frac{16}{20}\right)$$

$$= 53.1^\circ$$

[2 marks]**Answer 10**

$$(i) \quad E = \frac{k}{d^3} \quad \Rightarrow 75 = \frac{k}{2^3} \Rightarrow k = 600$$

$$\therefore \text{The formula sought is, } E = \frac{600}{d^3}$$

[3 marks]

$$(ii) \quad E = \frac{600}{4^3} = 9.375 \text{ volts/metre}$$

[2 marks]

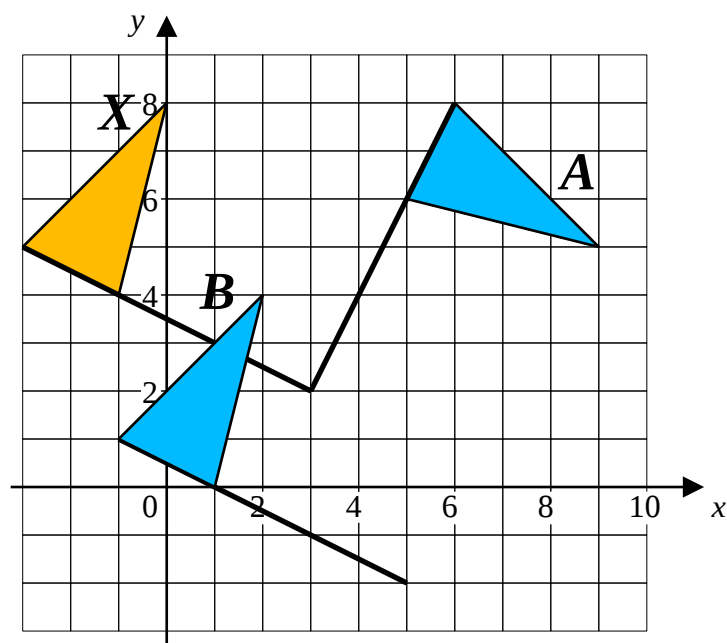
$$(iii) \quad 0.4 = \frac{600}{d^3} \Rightarrow d^3 = \frac{600}{0.4} = 1500$$

$$d = 11.4 \text{ metres}$$

[2 marks]

Answer 11

(i)



[2 marks]

(ii) Rotation
by 90° (anticlockwise)
about (6, 1)

[3 marks]

“Mind Your Maths” **Number 5**

Year 10 Exam Revision

You may use a calculator

Marks Available : 60

Question 1

$$f(x) = \sqrt[3]{4x - 1}, \quad x \in \mathbb{R}$$

- (i) Find the value of $ff(86)$

[3 marks]

- (ii) Find the value of x for which $f(x) = 11$

[3 marks]

Question 2

Expand the brackets and simplify,

- (i) $(3m + 6)(m + 7)$

[2 marks]

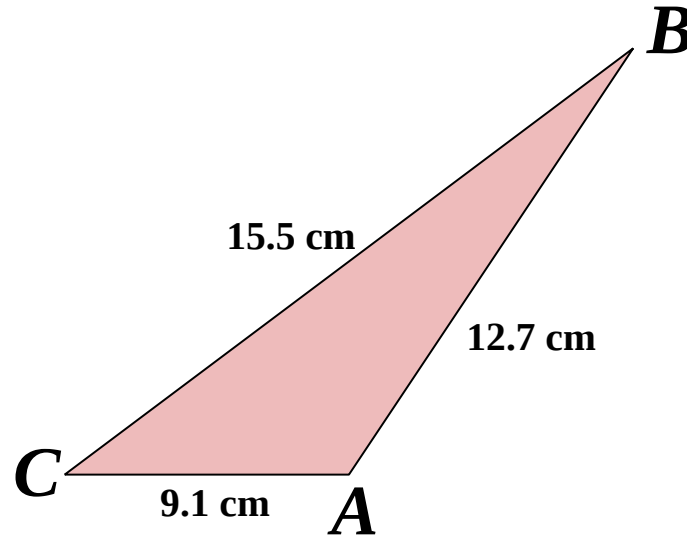
- (ii) $(3w - 5)^2$

[3 marks]

Question 3

Consider the triangle ABC where;

- The length AB is 12.7 cm
- The length BC is 15.5 cm
- The length CA is 9.1 cm



In the GCSE examination you're told the cosine rule is $c^2 = a^2 + b^2 - 2ab \cos C$ but often what you really need is this formula rewritten with $\cos C$ as the subject.

- (i) Either from memory, or by rearranging the above formula, write down the rewritten version of the cosine rule, often called “the cosine rule reversed”, with $\cos C$ as the subject.

[2 marks]

- (ii) Hence, or otherwise, calculate the size of angle C .
Give your answer in degrees, accurate to one decimal place.

[3 marks]

- (iii) The area of a triangle, in general, can be found using the formula.

$$Area \Delta = \frac{1}{2} b c \sin A$$

Where A is the included angle, between sides b and c .

Write down the version of this formula that would be used when C (rather than A) is the included angle between sides a and b (rather than b and c).

[2 marks]

- (iv) Hence, or otherwise, find the area of triangle ABC .
Give your answer to three significant figures.

[3 marks]

Question 4

Factorise completely,

(i) $x^2 + 6x + 8$

[2 marks]

(ii) $2x^2 + 11x + 12$

[2 marks]

Question 5

Jack and Jill are having an argument about the formula, $Speed = \frac{Distance}{Time}$



Jack says, “Speed is **directly** proportional to time”.

Jill says; “Speed is **inversely** proportional to time”.

(i) Who is correct ?

[1 mark]

(ii) Give a reason for your part (i) answer.

[1 mark]

(iii) Every day Toni travels to Birmingham University from his home in Telford. If one day she travels twice as fast (on average) as the day before, what can be said about the time taken ?

[1 mark]

Question 6



A house was valued at £325 000 on 1st December 2008.

During the following year (in the financial crash) it fell in value by 21.8%.

Work out the value of the house on 1st December 2009.

[2 marks]

Question 7

This question is about rearranging formulae.

- (i) Make *Distance* the subject of the formula,

$$Speed = \frac{Distance}{Time}$$

[2 marks]

- (ii) Make *t* the subject of the formula,

$$v = u + a t$$

[2 marks]

- (iii) Make *sin Z* the subject of the formula,

$$A = \frac{1}{2} x y \sin Z$$

[2 marks]

- (iv) Make *x* the subject of the formula;

$$c = ax + bx$$

[2 marks]

Question 8

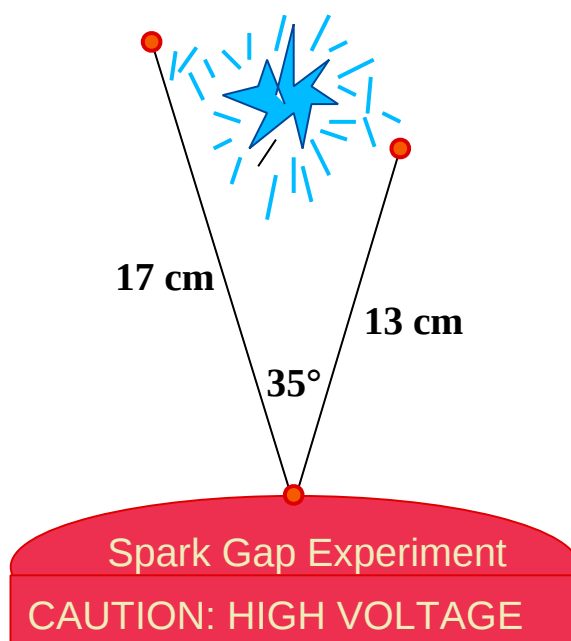
You may have noticed the lights flickering and going dim for short periods of time during the evenings recently.

This is due to Mr Patenden's "Spark Gap Experiment" TM (© PP, 2022).

He is using a HIGH VOLTAGE device in an attempt to create a ball of electricity known as Saint Elmo's Fire.

Doing this requires vast amounts of electricity, hence the drain on Shrewsbury's electricity supply and the recent increases in school fees to pay for the energy used.

This question is to test if you would be of any use as Mr Patenden's assistant.



The device is shown above, and consists of two antennae, one 17cm, the other 13cm. The angle between is currently (Ha, ha!) set at 35°.

Your job is to calculate the gap between the tips of the antennae, where the spark forms.

The cosine rule tells you that;

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

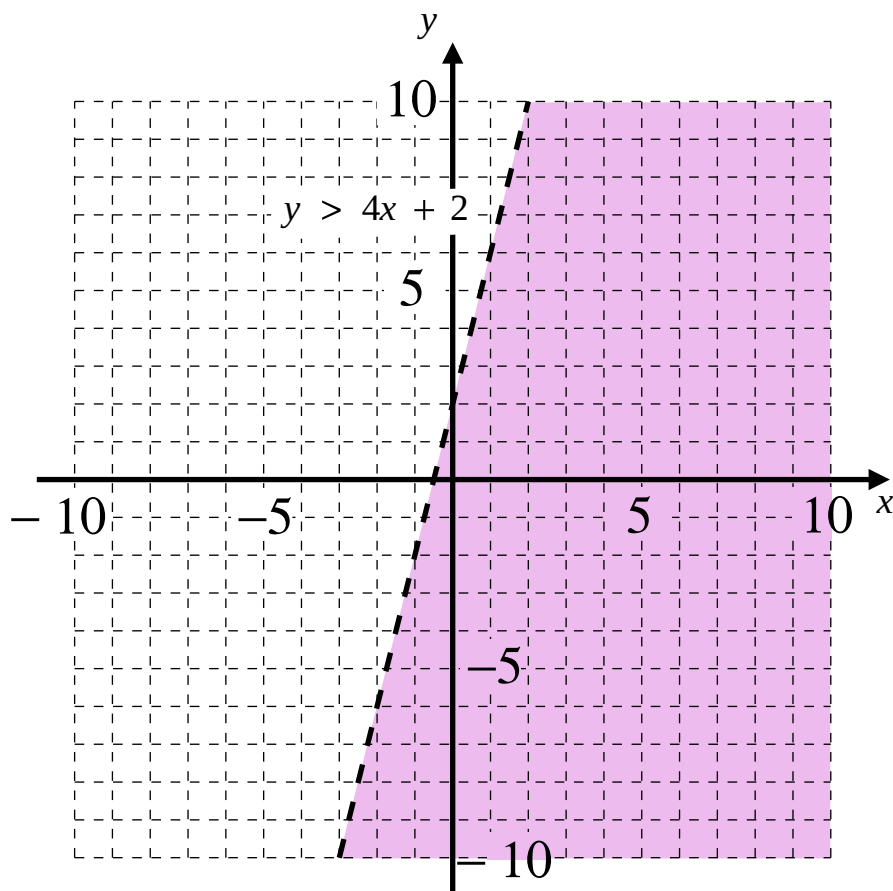
Use this to calculate, in cm, the spark gap.

Give your answer to 3 significant figures.

[3 marks]

Question 9

On the graph below the **unshaded** region is the inequality $y > 4x + 2$



To the graph add, using shading, the following inequalities.

(You are recommended to shade **out** the regions not wanted)

- (i) $y \leq 2$ (ii) $x \geq -5$ (iii) $y > -0.5x - 6$

Identify the region satisfying all four inequalities with the letter R.

[7 marks]

Question 10

Use your calculator to work out each of the following;

(i) $\left(\frac{9^2 - 5^2}{1^2 - 3^2} \right)^2$

[2 marks]

(ii) $\left(\frac{\tan 30^\circ \times \tan 60^\circ}{\sin 30^\circ + \tan 45^\circ + \cos 60^\circ} \right)^2$

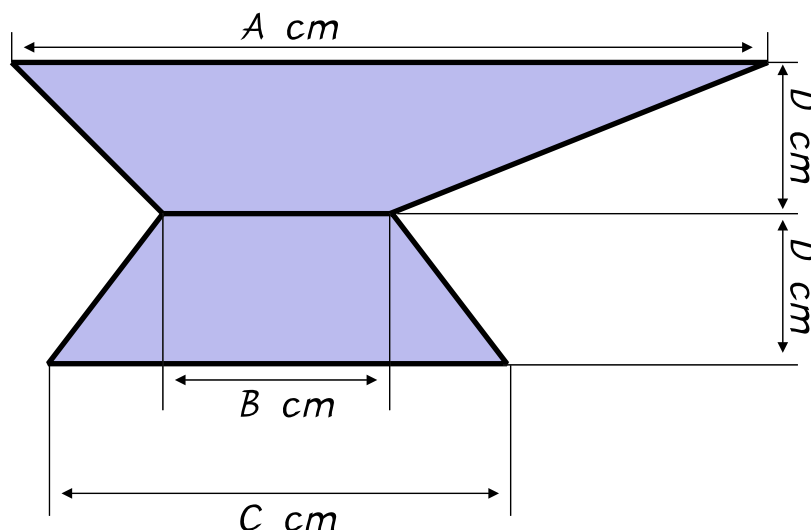
[2 mark]

Question 11

- (i) Prove that the "blacksmiths anvil", shown in cross section below, has a cross sectional area formula given by;

$$\text{Area} = \frac{D}{2} (A + 2B + C)$$

In your proof you may use, without justification, any of the standard area formulae for a triangle, a rectangle or a trapezium.



[4 marks]

- (ii) Hence, or otherwise, find the cross sectional area of an anvil in which $A = 48$ cm, $B = 20$ cm, $C = 32$ cm and $D = 18$ cm.

[4 marks]

“Mind Your Maths” **Answers 5**

Year 10 Exam Revision

Answer 1

$$f(x) = \sqrt[3]{4x - 1}, \quad x \in \mathbb{R}$$

(i) $ff(86) = f(7) = 3$

[3 marks]

(ii) $f(x) = 11$

$$\sqrt[3]{4x - 1} = 11$$

$$4x - 1 = 1331$$

$$4x = 1332$$

$$x = 333$$

[3 marks]

Answer 2

(i) $(3m + 6)(m + 7) = 3m^2 + 21m + 6m + 42$
 $= 3m^2 + 27m + 42$

[2 marks]

(ii) $(3w - 5)^2 = (3w - 5)(3w - 5)$
 $= 9w^2 - 15w - 15w + 25$
 $= 9w^2 - 30w + 25$

[3 marks]

Answer 3

(i) $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$

[2 marks]

(ii) $\cos C = \frac{15.5^2 + 9.1^2 - 12.7^2}{2 \times 15.5 \times 9.1} = 0.5734$
 $c = \arccos 0.5734 = 55.0^\circ$

[3 marks]

(iii) $\text{Area } \Delta = \frac{1}{2} ab \sin C$

[2 marks]

(iv) $\text{Area } \Delta = \frac{1}{2} \times 15.5 \times 9.1 \times \sin 55.0$
 $= 57.8 \text{ cm}^2$

[3 marks]

Answer 4

(i) $x^2 + 6x + 8 = (x + 4)(x + 2)$

[2 marks]

(ii) $2x^2 + 11x + 12 = (2x + 3)(x + 4)$

[2 marks]

Answer 5

(i) Jill is correct.

[1 mark]

(ii) For a fixed constant distance, k , the formula becomes,

$$Speed = \frac{k}{Time}$$

which is what inverse proportion looks like.

Or you could argue that travelling a certain fixed distance with more speed takes less time. The “more is less” is a hallmark of inverse proportion.

[1 mark]

(iii) It will take half the time.

[1 mark]

Answer 6

A loss of 21.8% is the same as keeping 78.2%.

$$325000 \times \frac{78.2}{100} = £254150$$

[2 marks]

Answer 7

(i) $Distance = Speed \times Time$

[2 marks]

(ii) $v = u + at$

$$v - u = at$$

$$t = \frac{v - u}{a}$$

[2 marks]

(iii) $A = \frac{1}{2}xy \sin Z$

$$\sin Z = \frac{2A}{xy}$$

[2 marks]

(iv) $c = ax + bx$
 $c = x(a + b)$
 $x = \frac{c}{a + b}$

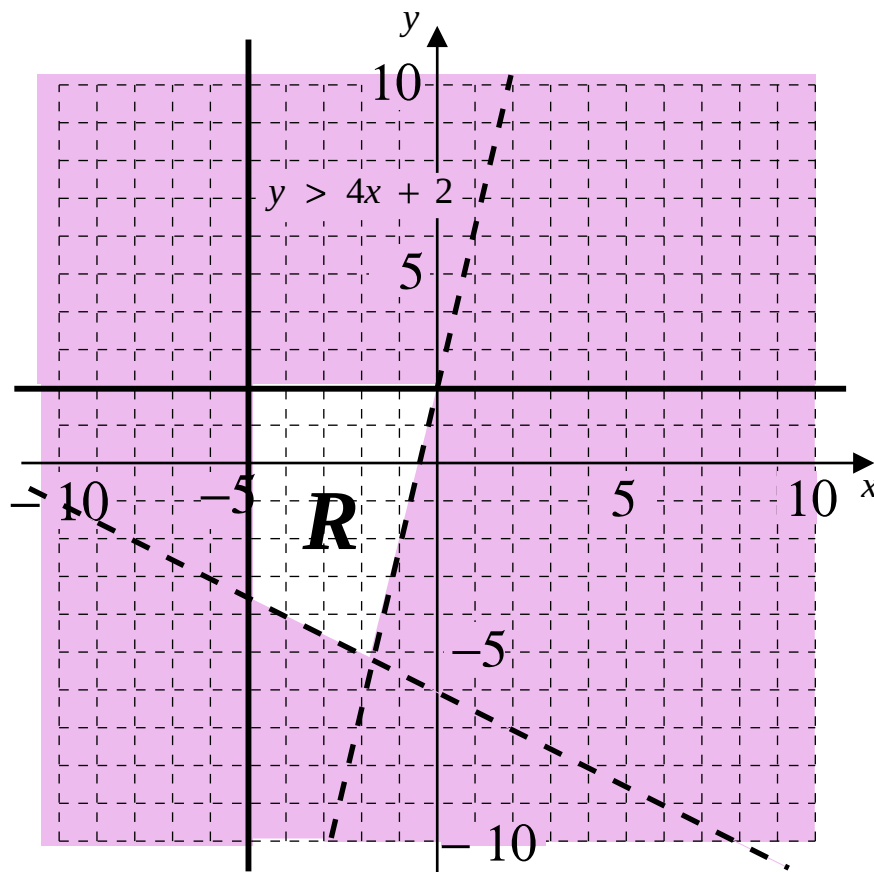
[2 marks]

Answer 8

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A \\&= 17^2 + 13^2 - 2 \times 17 \times 13 \cos 35 \\&= 95.93 \quad \therefore a = 9.79 \text{ cm}\end{aligned}$$

[3 marks]

Answer 9



[7 marks]

Answer 10

(i) 49 (ii) $\frac{1}{4}$

[2, 2 marks]

Answer 11

$$\begin{aligned}\text{(i)} \quad \text{Area} &= \frac{1}{2} (A + B) D + \frac{1}{2} (B + C) D \\&= \frac{AD}{2} + \frac{BD}{2} + \frac{BD}{2} + \frac{CD}{2} = \frac{D}{2} (A + 2B + C)\end{aligned}$$

(ii) 1080

[4, 4 marks]

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“Mind Your Maths” **Number 6**

Year 10 Exam Revision

You may use a calculator

Marks Available : 60

Question 1

Expand the brackets and, where possible, simplify your answer;

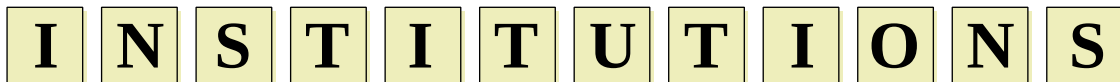
(i) $(x - 16)(x - 28)$ (ii) $(15x + 11)^2$

(iii) $x^7(x^5 - 13x^8)$ (iv) $(5x^2)^3 - (10x^3)^2$

[8 marks]

Question 2

One letter tile is to be picked at random from the following twelve;



Giving your answers as fractions in as simple a form as possible. what is the probability that it is;

(i) the letter O,

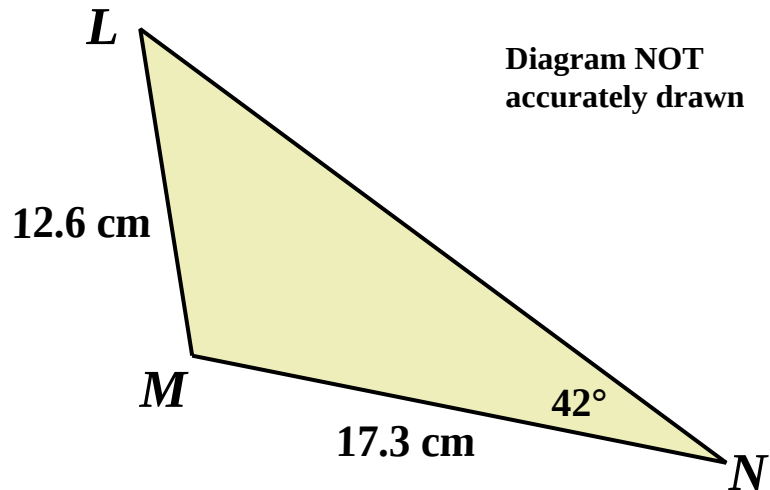
(ii) a letter S,

(iii) a vowel,

(iv) not a letter T ?

[4 marks]

Question 3



The diagram shows a triangle LMN , where LMN is an obtuse angle.

- (i) When an angle is described as being obtuse, what can you say about it ?

[1 mark]

- (ii) Work out the area of triangle LMN .

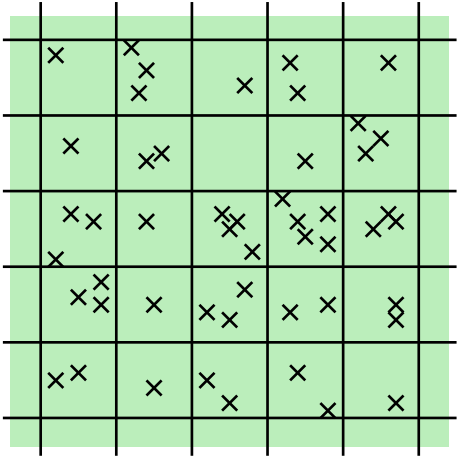
Hints : $\frac{\sin L}{l} = \frac{\sin N}{n}$ (The upside down version of the sine rule)

$$: \text{Area } \Delta = \frac{1}{2} l n \sin M$$

[5 marks]

Question 4

Dr Arachno, a Biologist, has divided up an area of a field into 25 squares, each measuring 1 m by 1 m.
In each square he records the occurrence of a certain species of spider.
His results are shown on the map below where each × indicates a spider found.



(i) Complete the table to show how many times each Spider Count occurred;

Spider Count	0	1	2	3	4	5	6
Squares							

[4 marks]

(ii) Determine the mean number of spiders per m².

[4 marks]

Question 5

The distance to Alpha Centauri is 25 277 120 000 000 miles.
The speed of light is 186 000 miles per second.
Calculate the time taken for light from Alpha Centauri to reach the Earth.
Give your answer correct to the nearest year.

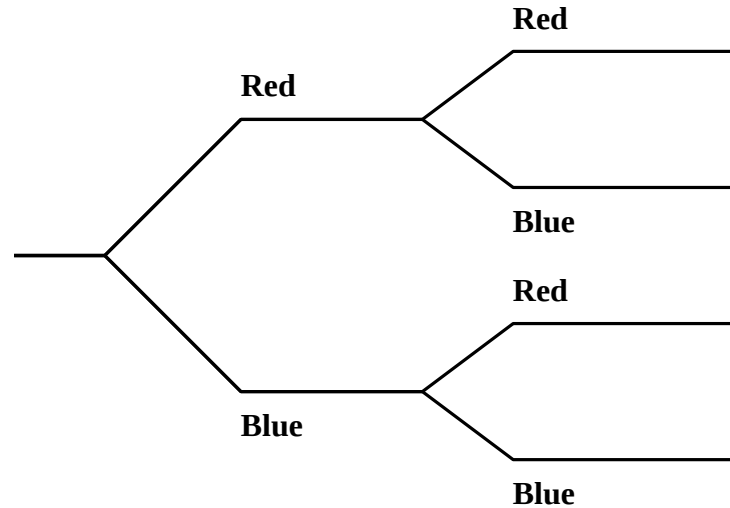
[4 marks]

Question 6

A bag contains 5 red and 7 blue marbles.

First one, and then a second marble is removed from the bag.

A tree diagram to illustrate the possibilities is shown below.



Determine the probability that;

(i) The first marble is red.

[1 mark]

(ii) Both marbles are red.

[2 marks]

(iii) Both marbles are the same colour.

[3 marks]

(iv) The second marble is red.

[3 marks]

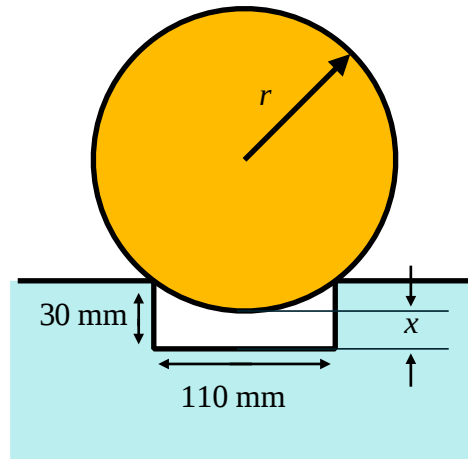
Question 7

$$f(x) = \frac{5x + 2}{3}$$

Find $f^{-1}(x)$

[3 marks]

Question 8



The diagram shows a ball of radius, r , 73 mm rolling along a groove of width 110 mm and depth 30 mm. Calculate the length marked x .

[6 marks]

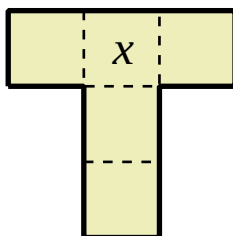
Question 9

The diagram shows a number square with a T marked in outline on it.
The number at the centre of the top row gives the T-number.
The T-number of the T shown is T-13.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

The T can be TRANSLATED to other positions on the number square.
In each position it must cover five numbers on the number square.

- (i) What is the smallest possible T-number ? [1 mark]
- (ii) What is the biggest possible T-number ? [1 mark]
- (iii) Find the sum of the numbers within the T-13 outline. [1 mark]
- (iv) On the diagram below write, in each square in terms of x , an expression for that square's number. [3 marks]



- (v) What is the sum, in terms of x , of the numbers within the T- x outline ? [2 marks]

(vi) Which T-number has an outline within which the numbers sum of 355 ?

[2 marks]

(vii) Explain why no T-number exists within which the numbers sum to 135.

[2 marks]

“Mind Your Maths” **Answers 6**

Year 10 Exam Revision

Answer 1

$$\begin{aligned} \text{(i)} \quad & (x - 16)(x - 28) \\ &= x^2 - 44x + 448 \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad & (15x + 11)^2 \\ &= (15x + 11)(15x + 11) \\ &= 225x^2 + 330x + 121 \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad & x^7(x^5 - 13x^8) \\ &= x^{12} - 13x^{15} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad & (5x^2)^3 - (10x^3)^2 \\ &= 125x^6 - 100x^6 \\ &= 25x^6 \end{aligned}$$

[8 marks]

Answer 2

$$\text{(i)} \quad \frac{1}{12}$$

$$\text{(ii)} \quad \frac{1}{6}$$

$$\text{(iii)} \quad \frac{5}{12}$$

$$\text{(iv)} \quad \frac{3}{4}$$

[4 marks]

Answer 3

(i) An obtuse angle is between 90° and 180°

[1 mark]

(ii)

$$\frac{\sin L}{l} = \frac{\sin N}{n}$$

$$\frac{\sin L}{17.3} = \frac{\sin 42}{12.6}$$

$$\sin L = \frac{17.3 \sin 42}{12.6}$$

$$= 0.9187$$

$$L = \arcsin 0.9187$$

$$= 66.7^\circ$$

$$\therefore M = 180 - (42 + 66.7)$$

$$= 71.3^\circ$$

$$\text{Area } \Delta = \frac{1}{2} l n \sin M$$

$$= \frac{1}{2} \times 17.3 \times 12.6 \times \sin 71.3$$

$$= 103 \text{ cm}^2$$

[5 marks]

Answer 4**(i)**

Spider Count	0	1	2	3	4	5	6
Squares	1	9	7	6	1	1	0

[4 marks]**(ii)**

$$\text{mean} = \frac{0 + 9 + 14 + 18 + 4 + 5}{25} = 2 \text{ spiders per m}^2$$

[4 marks]**Answer 5**

$$\begin{aligned}
 \text{Time} &= \frac{\text{Distance}}{\text{Speed}} \\
 &= \frac{25\,277\,120\,000\,000}{186\,000} \\
 &= 135898494 \text{ seconds} \\
 &= 2264975 \text{ minutes} \\
 &= 37750 \text{ hours} \\
 &= 1573 \text{ days} \\
 &= 4 \text{ years (to the nearest year)}
 \end{aligned}$$

[4 marks]**Answer 6**

$$\text{(i) } \quad \frac{5}{12}$$

$$\text{(ii) } \quad \frac{5}{12} \times \frac{4}{11} = \frac{20}{132} \quad \left(= \frac{5}{33} \right)$$

$$\begin{aligned}
 \text{(iii) } \quad &\frac{5}{12} \times \frac{4}{11} + \frac{7}{12} \times \frac{6}{11} \\
 &= \frac{20}{132} + \frac{42}{132} \\
 &= \frac{62}{132} \left(= \frac{31}{66} \right)
 \end{aligned}$$

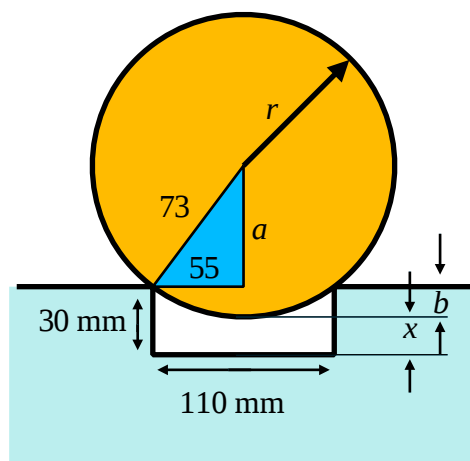
$$\begin{aligned}
 \text{(iv) } \quad &\frac{5}{12} \times \frac{4}{11} + \frac{7}{12} \times \frac{5}{11} \\
 &= \frac{20}{132} + \frac{35}{132} \\
 &= \frac{55}{132} \left(= \frac{5}{12} \right)
 \end{aligned}$$

[1, 2, 3, 3 marks]**Answer 7**

$$\begin{aligned}
 f(x) = \frac{5x + 2}{3} &\Leftrightarrow y = \frac{5x + 2}{3} \Leftrightarrow x = \frac{5y + 2}{3} \\
 3x &= 5y + 2 \\
 3x - 2 &= 5y \\
 f^{-1}(x) &= \frac{3x - 2}{5}
 \end{aligned}$$

[3 marks]

Answer 8



$$a = \sqrt{73^2 - 55^2}$$

$$= 48 \text{ mm}$$

$$b = 73 - 48$$

$$= 25 \text{ mm}$$

$$\therefore x = 30 - 25$$

$$= 5 \text{ mm}$$

[6 marks]

Answer 9

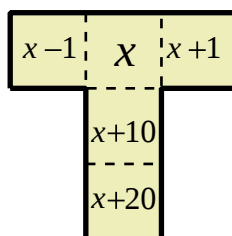
(i) T-2

(ii) T-79

(iii) 95

[1, 1, 1 marks]

(iv)



[3 marks]

(v) $S = 5x + 30$

[2 marks]

(vi) $5x + 30 = 355 \Leftrightarrow 5x = 325 \Leftrightarrow T-65$

[2 marks]

(vii) $5x + 30 = 135 \Leftrightarrow 5x = 105 \Leftrightarrow x = 21$ but this takes T off the grid.

[2 marks]

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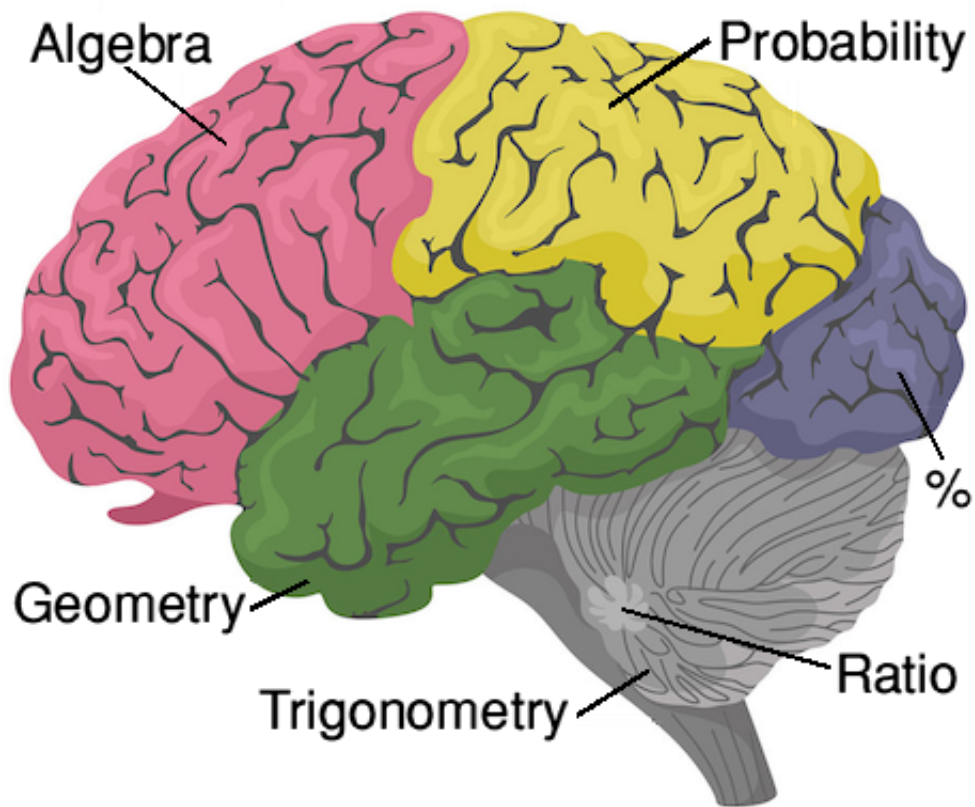
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Mind Your Maths



Year 10
Summer Exam Revision

“Mind Your Maths”

Year 10 Exam Revision 2022

Exams start Monday 6th June

These examinations are an important measure of progress. Take them seriously, revise properly and do your best. This is half of what you need to know for GCSE; being strong with this year's knowledge is a big step towards GCSE examination success next year.

Calculator Paper (75 minute, 80 mark exam)

- ◇ Fractions (6)
- ◇ Ratio (4)
- ◇ Basic Algebra (8)
- ◇ Linear Equations (7)
- ◇ FOIL (7)
- ◇ Quadratic Factorisation & Solving (8)
- ◇ Rearranging Formulae (10)
- ◇ Statistical Measures from a list (6)
- ◇ Basic Probability and sample Spaces (8)
- ◇ Easy Direct Proportion (2)
- ◇ Direct proportion with Powers (6)
- ◇ Constructions (2)
- ◇ 2D Inequalities (6)

Calculator Paper (75 minute, 80 mark exam)

- ◇ Circle Theorems (7)
- ◇ Pythagoras & SOH CAH TOA (4)
- ◇ Sine & Cosine Rules & $\frac{1}{2} ab \sin C$ (7)
- ◇ Easy Trig Equation (3)
- ◇ Tree Diagrams (7)
- ◇ Inverse Proportion (6)
- ◇ Similarity including area/volume ratios (7)
- ◇ 3D trig (5)
- ◇ Histograms (5)
- ◇ Algebraic fractions (8)
- ◇ Cumulative frequency Diagrams, Mean from Tables (8)
- ◇ Density / pressure (4)
- ◇ Functions (6)
- ◇ Percentages (3)

Your OneNote file is a your most valuable revision resource. Know your way around it. Add your own revision notes. Talk to your future self so when you need to relearn later on, you've made it easy for yourself.

MATHS CLINIC : 1.50 - 2.50 pm Monday & 5.00 - 6.00 pm Wednesday

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