



**PREDICTED
PAPER**



Video Solutions

Centre Number Candidate Number

Surname _____

Forename(s) _____

Signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 2 Calculator Allowed

Tuesday 7 June 2022

Morning

Time allowed: 1 hour 30 minutes

Student Self Reflection

Topics I need to **revise**

Topics I need to **learn**

Silly Mistakes?

Target mark for next time

For teacher use	
Pages	Mark
2-3	
4-5	
6-7	
8-9	
10-11	
12-13	
14-15	
16-17	
18-19	
20	
TOTAL	

Answer **all** questions in the spaces provided.

Do not write
outside the
box

1 Circle the expression equivalent to $2x^{-3}$

[1 mark]

$$-6x \qquad -\frac{x^3}{2} \qquad \frac{2}{x^3} \qquad \frac{1}{8x^3}$$

2 Which of the following numbers is **not** a triangular number.

Circle your answer.

[1 mark]

15 21 30 36

3



Circle the inequality represented by the number line above.

[1 mark]

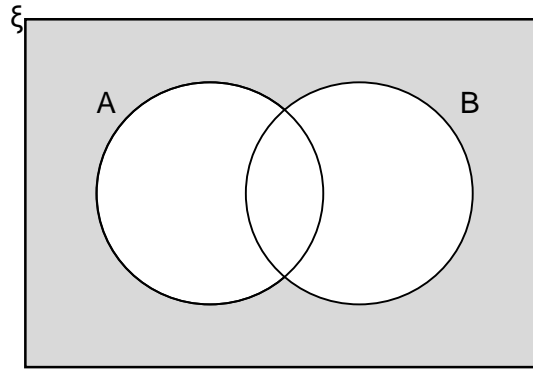
$$-1 < x \leq 2$$

$$-1 \leq x \leq 2$$

$$-1 \leq x < 2$$

$$-1 < x < 2$$

4



Which of these represents the shaded region?

Circle your answer.

[1 mark]

$(A \cap B)'$

$(A \cup B)'$

$A \cap B$

$A \cup B$

5

The planet Mars orbits the sun every 16500 hours.

Calculate the orbit time for Mars in **years**.

Give your answer to 2 significant figures.

[3 marks]

Answer _____ years

Turn over ►

6 Jim is playing Chess against a computer.

He records his results of the first 20 games in the table below.

Wins	7
Draws	2
Losses	11

6 (a) Write down the relative frequency of wins.

[1 mark]

Answer _____

6 (b) Jim plays a total of 400 games against the computer before retiring.

Use your answer to part (a) to estimate the number of times that Jim won.

[2 marks]

Answer _____

- 7 The table shows the share price for a company during January and March.

January	£3.00
February	
March	£1.08

From January to February the share price increased by 20%

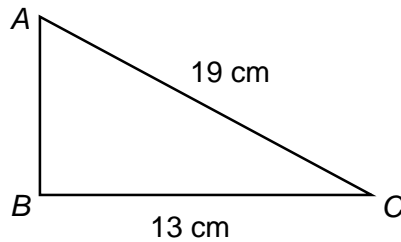
- 7 (a) Calculate the share price for February. [2 marks]

Answer _____

- 7 (b) Calculate the percentage decrease in the share price from February to March. [2 marks]

Answer _____ %

8 Here is a triangle ABC



Angle $ABC = 90^\circ$

Calculate the length AB.

Give your answer to 1 decimal place.

[3 marks]

Answer _____ cm

9 Write $7(2p + 4) - 2(p - 5)$ in the form $ap + b$

[3 marks]

Where a and b are integers.

Answer _____

10

$x + 7 = 22$

$y = 18$

What percentage of y does x represent?

[3 marks]

Answer _____ %

11

A vet records the mass of dogs that visit their surgery.

The mean mass of the first 8 dogs is 34.2 kg.

The next dog to come in has a mass of 27kg.

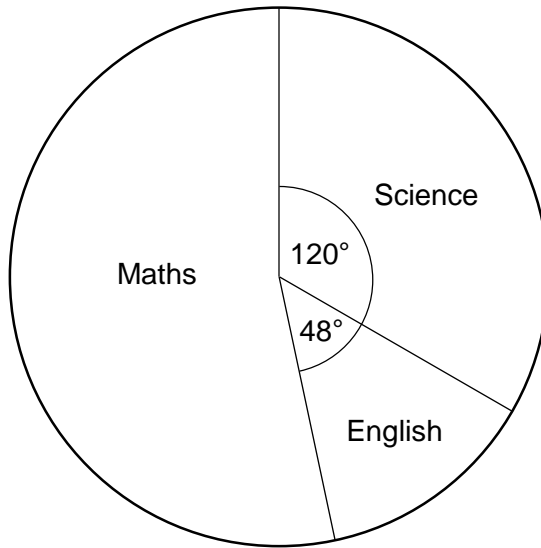
Calculate the mean mass of all 9 dogs.

[3 marks]

Answer _____ kg

12

The pie chart shows the favourite core subject of students at a large school.



430 of the students selected science.

Work out how many students selected Maths.

[3 marks]

Answer _____

13

 P is a prime number. C is a cube number.

$$C = 2P + 1$$

Find a possible set of values for P and C .**[3 marks]**

$$P = \underline{\hspace{2cm}} \quad C = \underline{\hspace{2cm}}$$

Turn over for next question

15 (a) Factorise $x^2 - 10x - 24$ **[2 marks]**

Answer _____

15 (b) Solve $x^2 - 10x - 24 = 0$ **[1 mark]**

Answer _____

15 (c) Write $x^2 - 10x - 24 = 0$ in the form $(x - a)^2 - b$ **[2 marks]**

Answer _____

15 (d) Write down the coordinates of the vertex of the graph $y = x^2 - 10x - 24$ **[1 mark]**

Answer (_____ , _____)

16 Bobbie is painting her room.

Her paint is made by mixing yellow, blue and white paint in the ratio 3 : 7 : 2

Bobbie has

8 litres of yellow paint

18 litres of blue paint

5 litres of white paint

Calculate the maximum amount of paint that Bobbie can make.

Give your answer in litres.

[3 marks]

Answer _____ litres

17 A graph has the equation $x^2 + y^2 = 10$

Circle the radius of the circle.

[1 mark]

5

$\sqrt{5}$

$\sqrt{10}$

100

18 (a) Show that the lines $y = \frac{2}{3}x + 6$ and $4y + 6x = 5$ are perpendicular.

Do **not** use a graphical method.

[4 marks]

18 (b) Another line has the equation $y = \frac{3}{4}x + c$

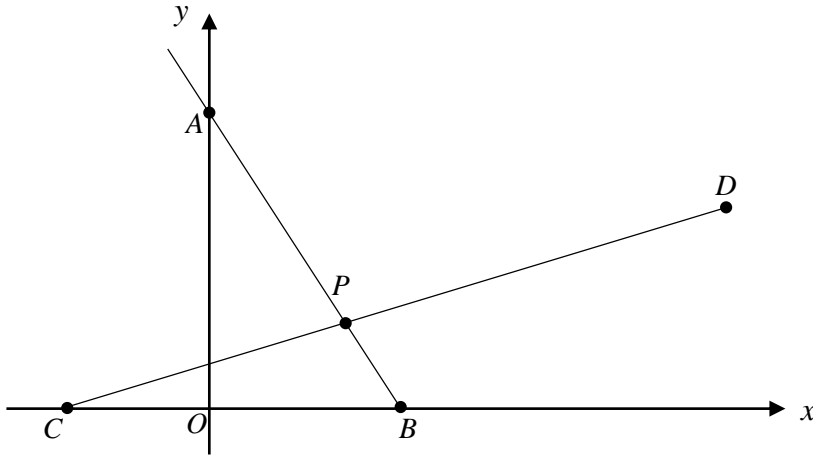
The point (36, 15) is on the line.

Find the value of c

[2 marks]

Answer _____

19



AB and CD are straight lines with intersection P .

Point A has coordinates $(0,8)$

Point B has coordinates $(4,0)$

Point C has coordinates $(-3,0)$

$AP : PB = 3 : 1$

$CP : PD = 2 : 3$

Find the coordinates of point D .

[4 marks]

Answer (_____ , _____)

20 A lake contains 400 fish.

Tomas sampled 25 fish from the lake and measured their lengths.

The results are shown in the table below.

Length, L , (cm)	Frequency
$0 < L \leq 10$	8
$10 < L \leq 20$	11
$20 < L \leq 30$	6

Use the information to estimate how many of the fish in the **lake** are less than 25cm in length.

[3 marks]

Answer _____

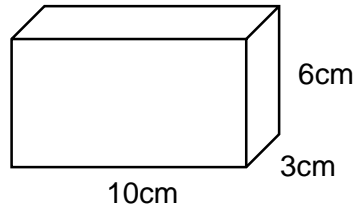
21 N is multiplied by $\frac{15}{12}$

[1 mark]

Tick the correct statement.

- N has been increased by 1.25%
- N has been increased by 2.5%
- N has been increased by 25%
- N has been increased by 125%

22 Here is a cuboid.

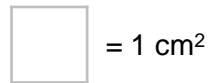


The cuboid is placed on a table with one of the faces in contact with it.

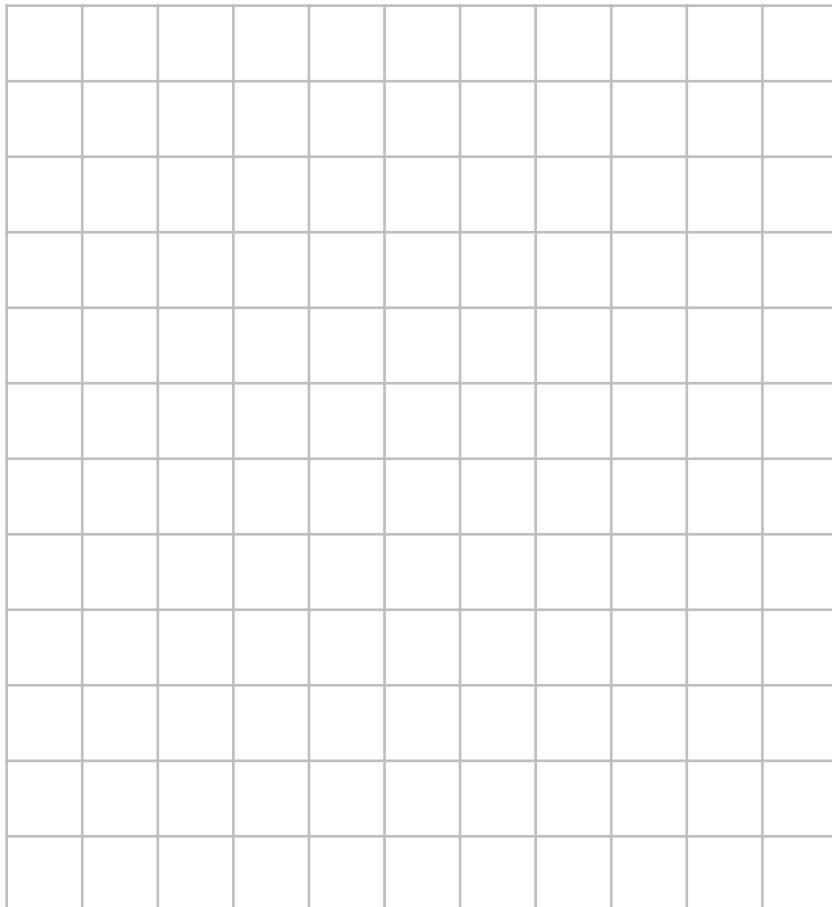
It is placed in a position that will create the **greatest** amount of pressure.

22 (a) On the grid below draw the plan view of the cuboid in this position.

Your diagram should be to scale.



[2 marks]



22 (b) The cuboid exerts a force of 9 Newtons (N) onto the table.

Work out the pressure maximum pressure the cuboid can exert.

Give your answer in N/cm^2

[2 marks]

Answer _____ N/cm^2

Turn over for next question

23 $f(x) = \frac{x+2}{3x}$

Work out $f^{-1}(x)$

[3 marks]

Answer _____

24 Two towns are connected by one road of length 330 miles (to 2 significant figures)

A car travels between the two towns taking 6 hours (to the nearest hour).

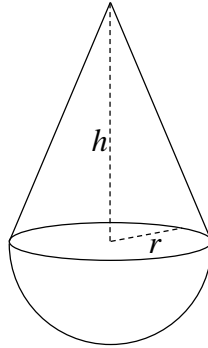
The speed limit of the road is 60mph.

Use bounds to show that the driver may have exceeded the speed limit. [3 marks]

25

Volume of a sphere = $\frac{4}{3}\pi r^3$ where r is the radius.

Volume of a cone = $\frac{1}{3}\pi r^2 h$ where r is the radius
 h is the perpendicular height.



A compound shape is made by placing a cone on top of a hemisphere.

The volume of the hemisphere is 2000cm^3

The volume of the cone is 3000cm^3

Calculate the **total** height of the compound shape.

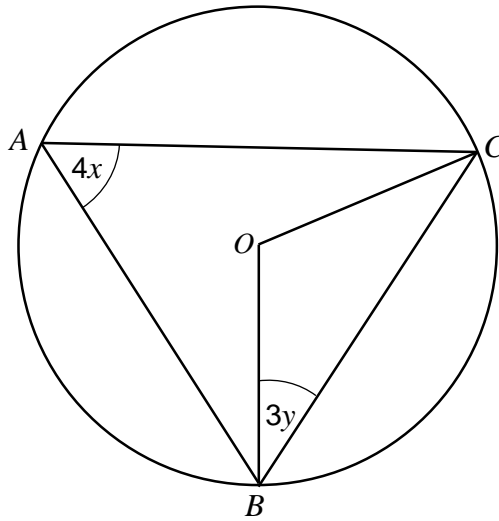
Give your answer to 3 significant figures.

[6 marks]

Answer _____ cm

26

A , B and C are points on the circumference of a circle with centre O .



A , B and C are points on the circumference of a circle with centre O .

Prove that $y = 30 - \frac{4}{3}x$

[4 marks]

END OF QUESTIONS