PREDICTED PAPER

Video Solutions

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.

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

[1 mark]

$-6x$ $-\dfrac{x^3}{2}$ $\dfrac{2}{x^3}$ $\dfrac{1}{8x^3}$
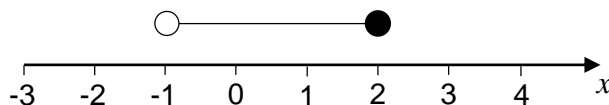
2   Which of the following numbers is **not** a triangular number.

Circle your answer.

[1 mark]

15   21   30   36

3

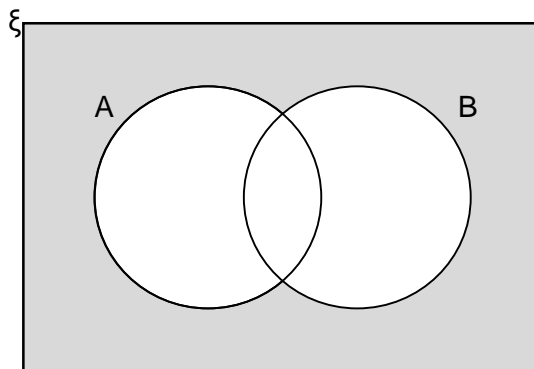Circle the inequality represented by the number line above.

[1 mark]

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

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4

ξ

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

7

Turn over ►

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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 _____

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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]
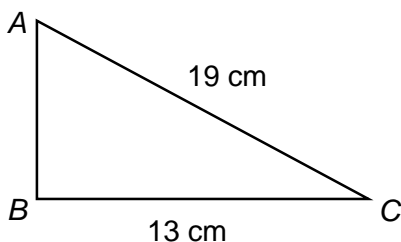
_____

_____

_____

_____

_____

Answer _____ %

7

Turn over ▶

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8 Here is a triangle ABC

Angle $ABC = 90°$

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 _____

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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.

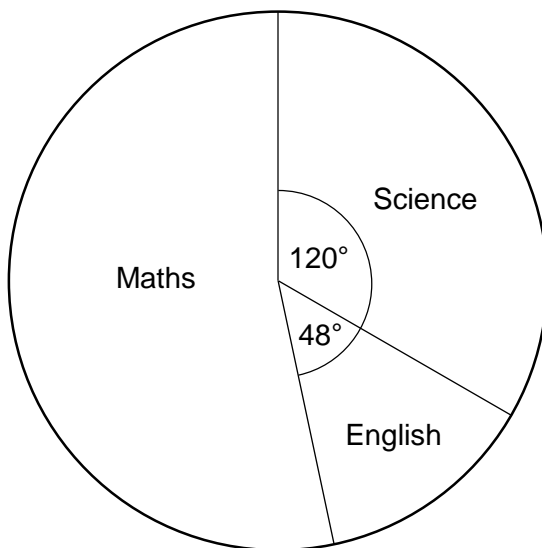Calculate the mean mass of all 9 dogs.

[3 marks]

Answer _____ kg

12

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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 _____

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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]

_____

_____

_____

_____

_____

_____

_____

_____

$P =$ _____ $C =$ _____

Turn over for next question

6

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14   Machine A can produce a can every 2 seconds.
Machine B can produce a can every 1.2 seconds.

A company needs to produce 2480 cans.

Both machines on turned on together at 1pm and they start producing cans.

At 1:25pm Machine B is turned off due to overheating.
Machine A continues producing the cans.

At what time will the required number of cans be produced?

[4 marks]

Answer _____

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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   (_____ , _____)

10

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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

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

Do **not** use a graphical method.

[4 marks]

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

The point (36, 15) is on the line.
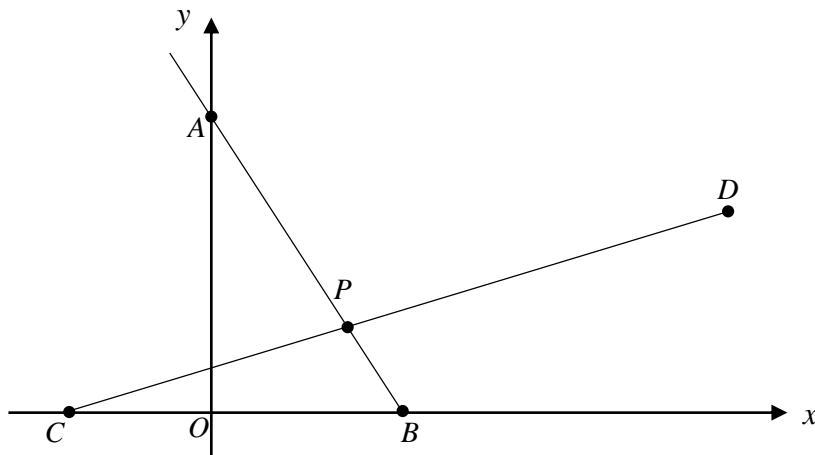
Find the value of c

[2 marks]

Answer _____

10

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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 (_____ , _____)

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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%

8

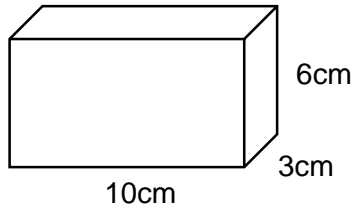**Turn over ►**

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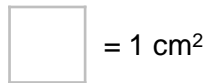
22   Here is a cuboid.

6cm

3cm

10cm

The cuboid is placed on a table with one of the faces in contact with it.
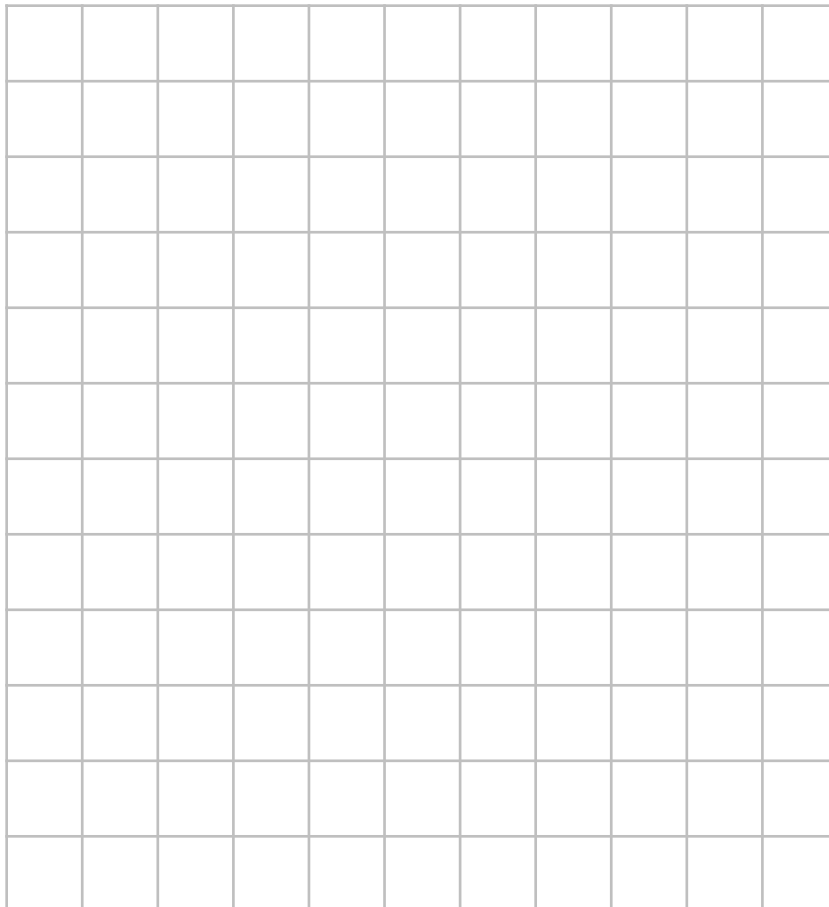
In is placed in a position that will create the **greatest** amount of pressure.

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

Your diagram should be to scale.   [ ] = 1 cm^2 **[2 marks]**

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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

4

Turn over ▶

Video Solutions

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

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.

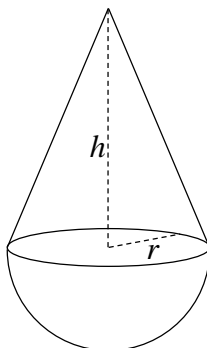Use bounds to show that the driver may have exceeded the speed limit. **[3 marks]**

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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 2000cm³

The volume of the cone is 3000cm³

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

Give your answer to 3 significant figures.   **[6 marks]**
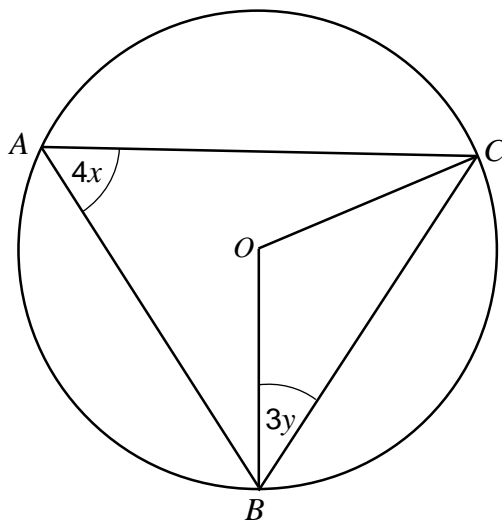
Answer _____ cm

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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 $y = 30 - \dfrac{4}{3}x$

[4 marks]

END OF QUESTIONS

4

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