1st Class Maths

PREDICTED PAPER

Centre Number

Candidate Number

Surname _____

Forename(s) _____

Signature _____

GCSE
MATHEMATICS

H

Higher Tier   Paper 3 Calculator Allowed

Monday 13 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	
20-21	
22	
TOTAL	

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

1   Circle the smallest number.

[1 mark]

$$0.\dot{2} \qquad 0.22 \qquad 0.22\dot{1} \qquad 0.\dot{2}\dot{1}$$

2   Work out the lowest common multiple (LCM) of 10, 20 and 40

Circle your answer.

[1 mark]

$$5 \qquad 40 \qquad 80 \qquad 8000$$

3   Simplify $a + b \times 6 - (b - a)$

Circle your answer.

[1 mark]

$$5b \qquad 2a + 5b \qquad 2a + 6 \qquad 6$$

Video Solutions

4 The bearing of B from A is 070°

Circle the bearing of A from B. **[1 mark]**

110° 160° 250° 290°

5 The table shows the year groups of different members of a chess club.

Year 8	7
Year 9	10
Year 10	6
Year 11	4

The school needs to select a team of 4 members to play a competition.

There must be one member from each year group.

In how many ways can the school select the 4 team members? **[2 marks]**

Answer _____

6

Turn over ▶

Video Solutions

6   Work out the highest common factor (HCF) of 36 and 120   **[2 marks]**

Answer _____

7   A packet of crisps has a mass of 25 grams (to the nearest gram).

7 (a)   Complete the error interval for the mass of the packet of crisps.   **[2 marks]**

Answer _____ g ≤ mass < _____ g

A multipack of crisps contains 12 of the individual packets.

7 (b)   Complete the error interval for the mass of the multipack of crisps.   **[1 mark]**

Answer _____ g ≤ mass < _____ g

Video Solutions

8 **(a)** The first two terms of a **geometric** progression are shown.

32   24   ………   ………

Work out the third and fourth terms.   **[2 marks]**

Third Term _____

Fourth Term _____

8 **(b)** An **arithmetic** progression is shown below.

20   18   16   14   ……..

Work out the nth term.   **[2 marks]**

Answer _____

9

Turn over ▶

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9 $\mathbf{a} = \begin{pmatrix} 7 \\ -3 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -3 \\ 6 \end{pmatrix}$

Work out 2**a** + **b**   **[2 marks]**

Answer _____

10 Ryan and Amy share £315 in the ratio 4 : 5   **[3 marks]**

Work out how much money Ryan receives.

Answer £ _____

Video Solutions

11   The table below shows information about how students travel to school.

	Walk	Car	Other
2018		220	62
2019	114		48
Total	**246**		**110**

Between 2018 and 2019 the number of students coming by car increases by 30%

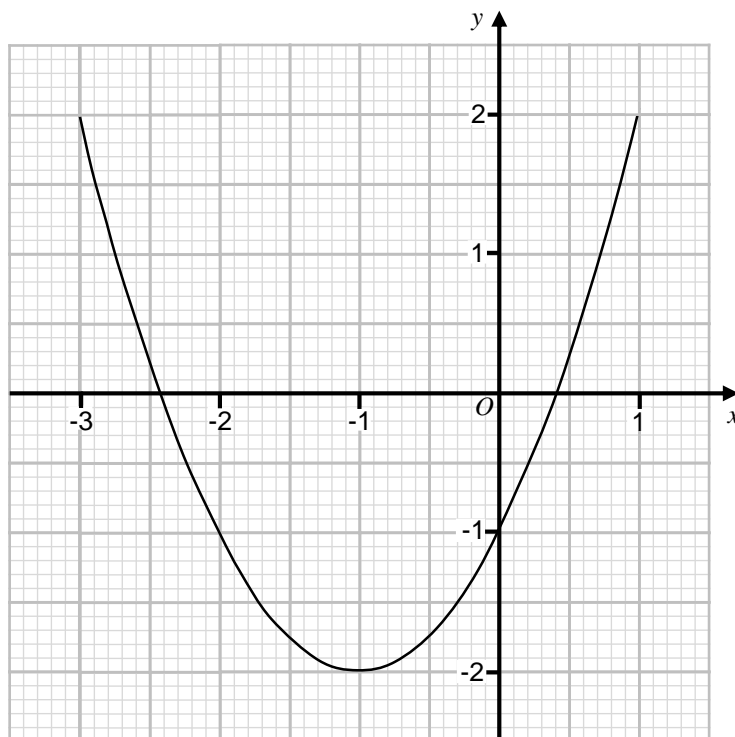Complete the table.

[4 marks]

Turn over for next question

9

Turn over ▶

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12   Here is the graph of $y = x^2 + 2x - 1$ for x values from -3 to 1

12 (a)   Write down the coordinates of the turning point of the graph.

[1 mark]

Answer   (_____ , _____)

12 (b)   Write down the roots of $y = x^2 + 2x - 1$

[2 marks]

Answer _____

Video Solutions

13 Wade runs a 400m race in 60 seconds.

He runs the first 300m of the race at an average speed of 7.5 m/s

Work out his average speed for the last 100m of the race.

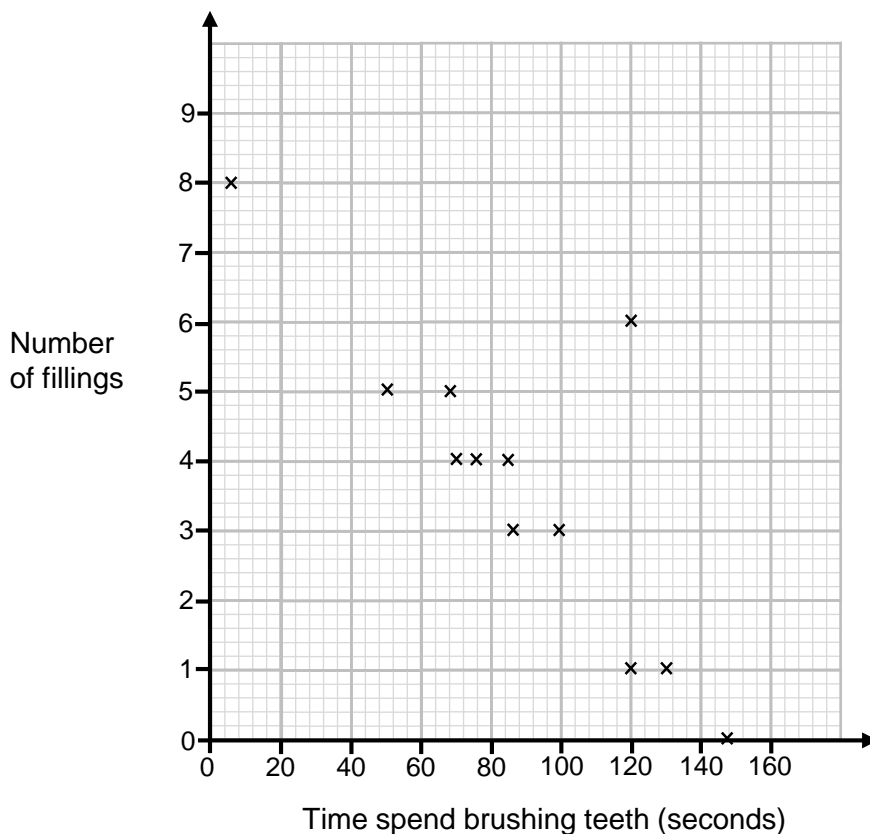**[3 marks]**

Answer _____ m/s

Turn over for next question

6

Video Solutions

Do not write outside the box

14 The scatter graph shows time spent brushing teeth and the number of fillings for 12 patients at a dentist.

Number of fillings

Time spend brushing teeth (seconds)

14 (a) Another patient attending the dentist has 2 fillings.

[2 marks]

Use a line of best fit to estimate how long they brush their teeth for.

Answer _____ seconds

14 (b) One of the patients plotted on the graph is considered an **outlier**.

Circle the cross (×) on the diagram represented by this patient.

[1 mark]

Video Solutions

15 The table shows information about two countries.

	Population	**Area (square miles)**
Country A	72 000 000	120 000
Country B	15 000 000	

Population Density $= \dfrac{\text{Population}}{\text{Area}}$

The population density of country A is twice the population density of country B.

Calculate the area of country B.

[3 marks]

Answer _____ square miles

Video Solutions

16 Tia has £5000 to invest for 3 years. She looks at the deals of two banks.

Bank A

2.5% compound interest

Bank B

First Year
4% compound interest

All Other Years
1% compound interest

How much **more** money will Tia make going with bank A compared to bank B.

[4 marks]

Answer £ _____

17 $f(x) = x^2 - 2$ and $g(x) = 3x$

Work out $gf(x)$

Circle your answer.

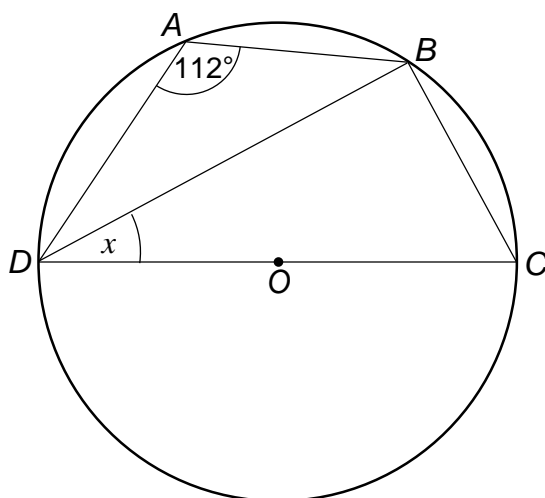**[1 mark]**

$9x^2 - 6$ $3x^2 - 6$ $9x^2 - 2$ $3x^2 - 2$

Video Solutions

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

Not drawn accurately

Work out the size of angle x

[3 marks]

_____

_____

_____

_____

_____

_____

_____

_____

Answer _____ °

8

Turn over ▶

Video Solutions

19 Aggie and James are both members of a running club.

During a season they run the same distance 20 times and record their results.

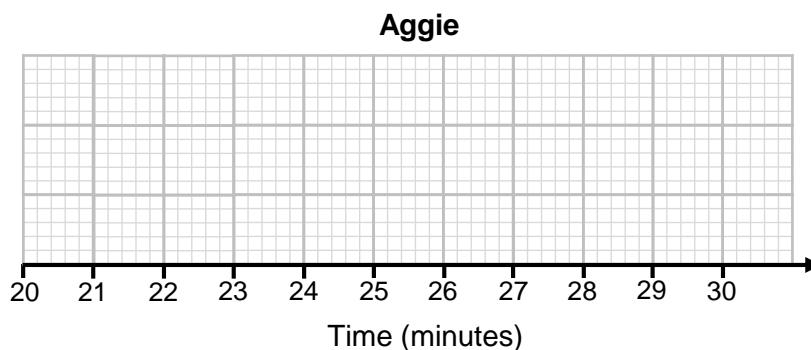**19 (a)** Here is some information about Aggie's times.

Fastest 22 minutes
Slowest 30 minutes

Lower Quartile 24 minutes
Upper Quartile 29 minutes

Median 26 minutes

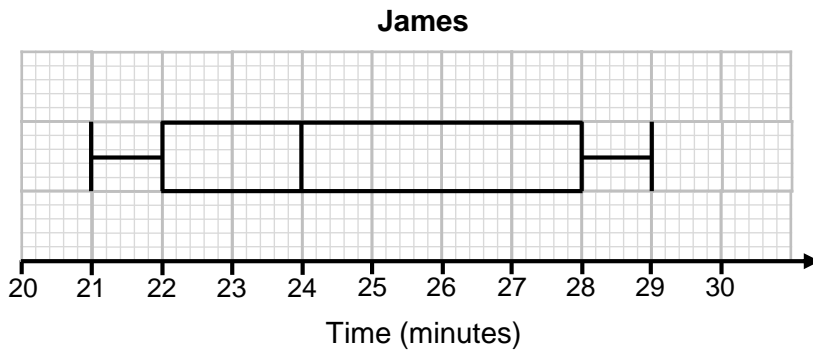Draw a box plot to represent Aggie's times.

[2 marks]

Aggie

Time (minutes)

Video Solutions

19   This box plot represents James' times.

James

Time (minutes)

19 (b)   Who was faster on average, Aggie or James?

Work out the median to support your answer.   **[2 marks]**

_____

_____

_____

_____

_____

19 (c)   Who has more consistent times, Aggie or James?

Work out the interquartile range to support your answer.   **[2 marks]**

_____

_____

_____

_____

_____

6

Turn over ▶

Video Solutions

20 Expand and simplify fully $(x + 3)(x - 3)^2$

[3 marks]

Answer _____
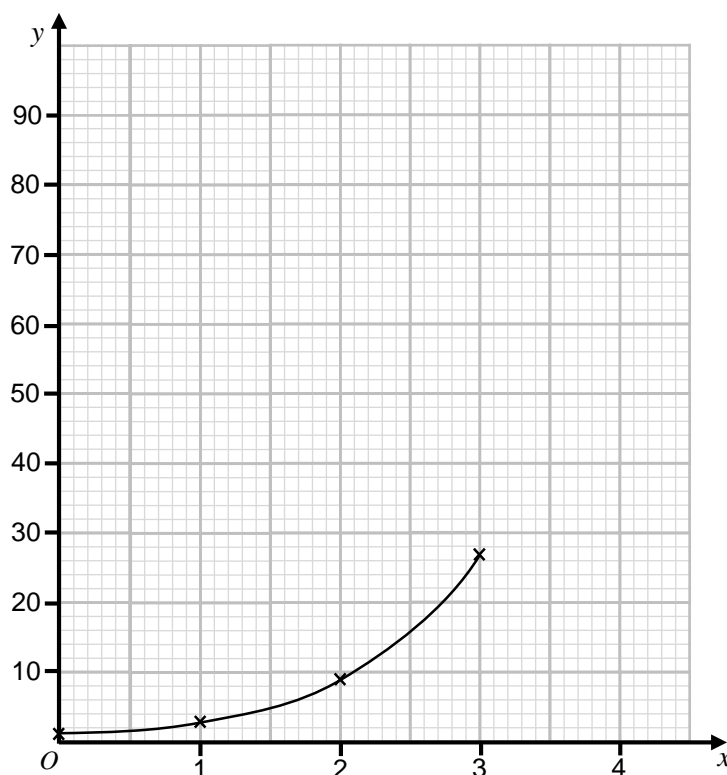
21 Factorise fully $8x^6y - 12x^3y^5z$

[2 marks]

Answer _____

Video Solutions

22   Part of a graph with equation $y = a^x$ shown below.

22 (a)   Write down the value of a

[1 mark]

$a = $ _____

22 (b)   Plot the point for when $x = 4$ and complete the graph.

[2 marks]

8

Turn over ▶

23 A bag contains numbered counters.

5 of the counters have number 1
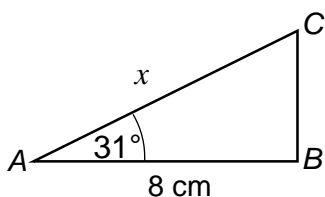3 of the counters have number 2
2 of the counters have number 3

A counter is taken from the bag and **not** replaced.
A second counter is then taken from the bag.

Calculate the probability that the product of the two numbers is 3.

[3 marks]

Answer _____

24 Here is a triangle ABC

Not drawn
accurately

Angle $ABC = 90°$

Circle the calculation that could be used to find x.

[1 mark]

$8 × \cos(31)$ $8 × \sin(31)$ $\dfrac{8}{\cos(31)}$ $\dfrac{8}{\sin(31)}$

Video Solutions

25 Here is some information about the lengths of different matches at a tennis club.

Time (minutes)	Frequency
$0 < t \le 20$	6
$20 < t \le 25$	4
$25 < t \le 40$	9

The information is represented in the following histogram.

Frequency Density

Time (minutes)
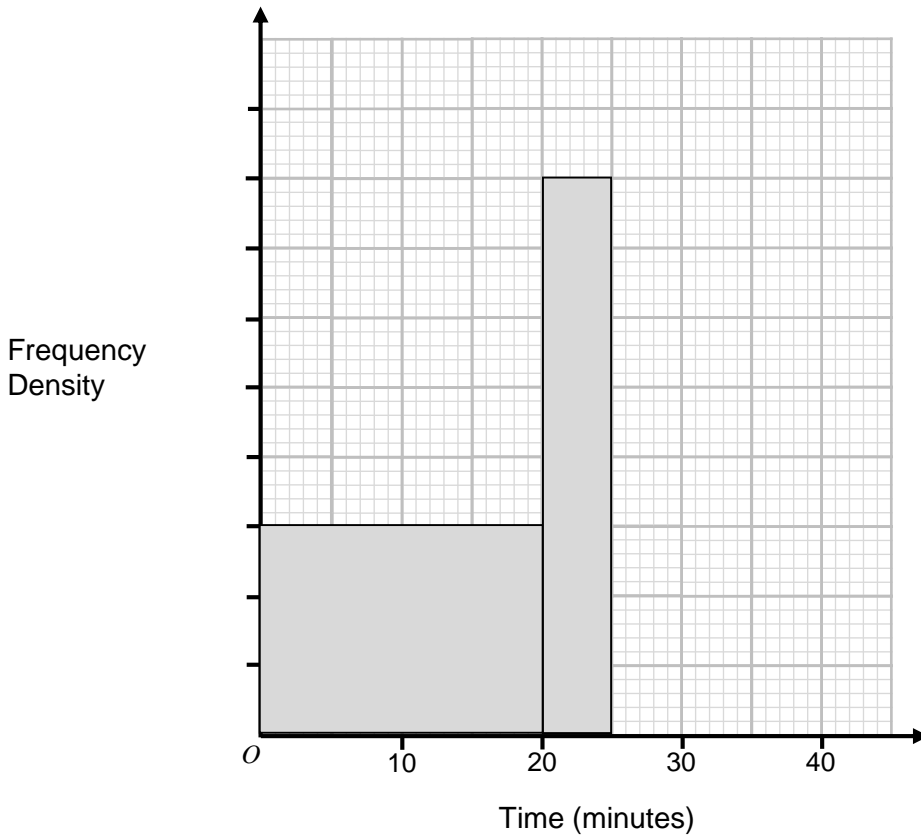
25 Complete the histogram

[3 marks]

7

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Video Solutions

26   A compound shape is made by placing half of a cylinder on top of a cube.

The side length of the cube is 8 cm.

8cm

Calculate the surface area of the compound shape.

[5 marks]

Answer _____ cm^2

Video Solutions

27   *ABCD* is a quadrilateral.

8cm

14cm

42°   62° 80°

Not drawn accurately

Calculate the length of side AB.

[5 marks]

Answer _____ cm

10

Turn over ▶

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28   Solve the simultaneous equations.

$$y = 2x^2 + 30x + 61$$

$$y = 1 - 4x$$

[5 marks]

Answer _____

END OF QUESTIONS

5

Video Solutions