



Class
Maths

**PREDICTED
PAPER**



Video Solutions

Candidate Surname		Other names	
Centre Number		Candidate Number	
Friday 20 May 2022			
Morning (Time: 1 hours 30 minutes)			
Mathematics			
Paper 1 (Non-Calculator)			
Higher Tier			
You must have: Ruler graduated in centimetres and millimetres, protractor, pairs of compasses, pen, HB pencil, eraser. Tracing paper may be used.			Total Marks

Student Self Reflection

Topics I need to **revise**

Topics I need to **learn**

Silly Mistakes?

Target mark for next time





Answer ALL questions

Write your answers in the spaces provided

You must write down all the stages in your working.

1 Write 126 as a product of its prime factors.

.....
(Total for Question 1 is 2 marks)

2 Solve $9p < 48 - 3p$

.....
(Total for Question 2 is 2 marks)

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3 (a) Write 6.25×10^{-3} as an ordinary number.

.....
(1)

(b) Work out $(7 \times 10^{12}) \times (4 \times 10^3)$
Give your answer in standard form.

.....
(2)

(Total for Question 3 is 3 marks)

4 Helen and Emma share some money in the ratio 2 : 5
Emma receives £21 more than Helen.

Work out how much money Emma receives.

.....
(Total for Question 4 is 3 marks)



5 (a) Work out $\frac{4}{3}$ of 24

.....
(1)

(b) Work out $4\frac{2}{3} + 3\frac{1}{4}$

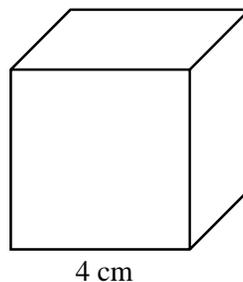
.....
(2)

(Total for Question 5 is 3 marks)

6 The diagram show a solid cube.

The cube has a mass of 16 grams.

Work out the density of the cube.



..... g/cm³

(Total for Question 6 is 3 marks)

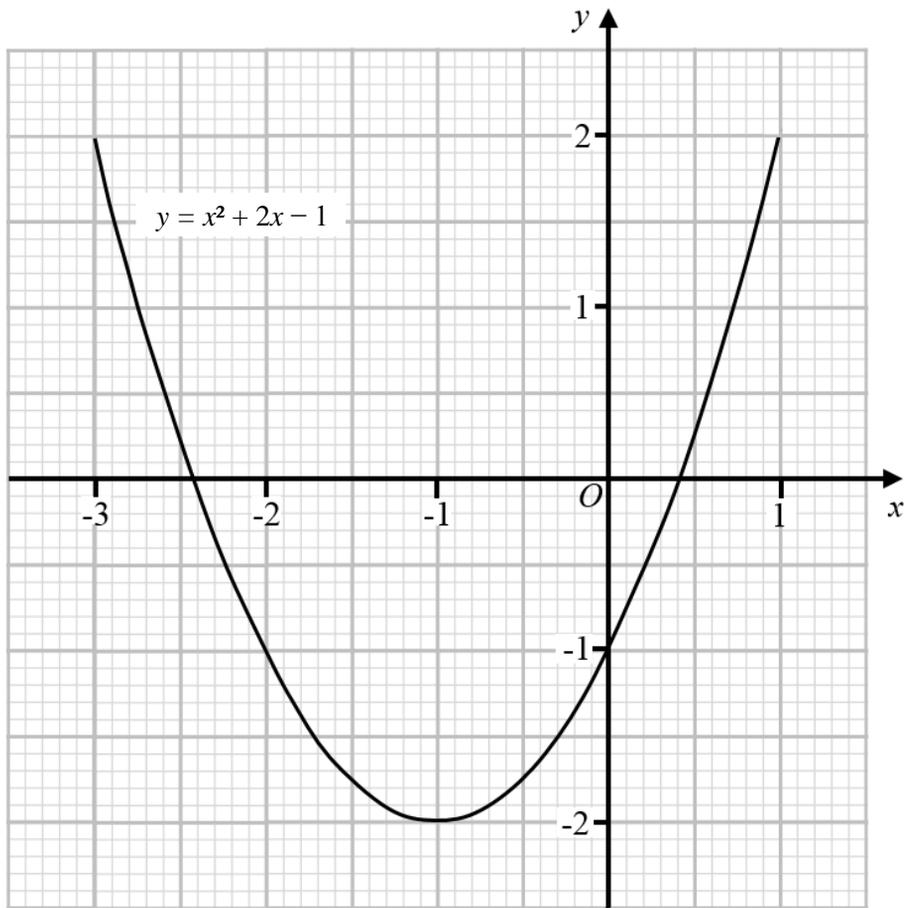
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7



Use this graph to find estimates for the solutions of the quadratic equation $x^2 + 2x - 1 = 0$

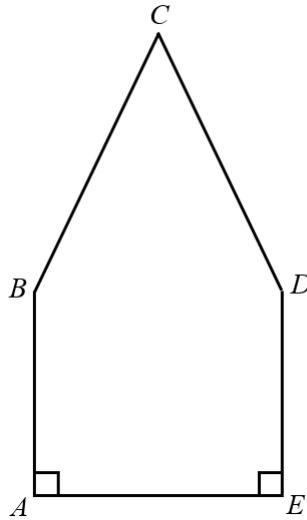
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(Total for Question 7 is 2 marks)

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- 8 $ABCDE$ is a pentagon.
The pentagon has one line of symmetry.



Angle $ABC = 4 \times$ angle BCD .

Work out the size of angle BCD .
You must show all your working.

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.....
(Total for Question 8 is 4 marks)





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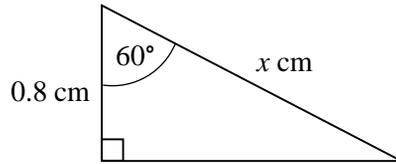
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9 (a) Write down the exact value of $\tan 60^\circ$

.....
(1)

(b)



Given that $\cos 60^\circ = 0.5$,
work out the value of x .

..... cm
(2)

(Total for Question 9 is 3 marks)

10 a is 25% of b .
 b is 30% of c .

Write the ratio $a : b : c$
Give your ratio in its simplest form.

.....

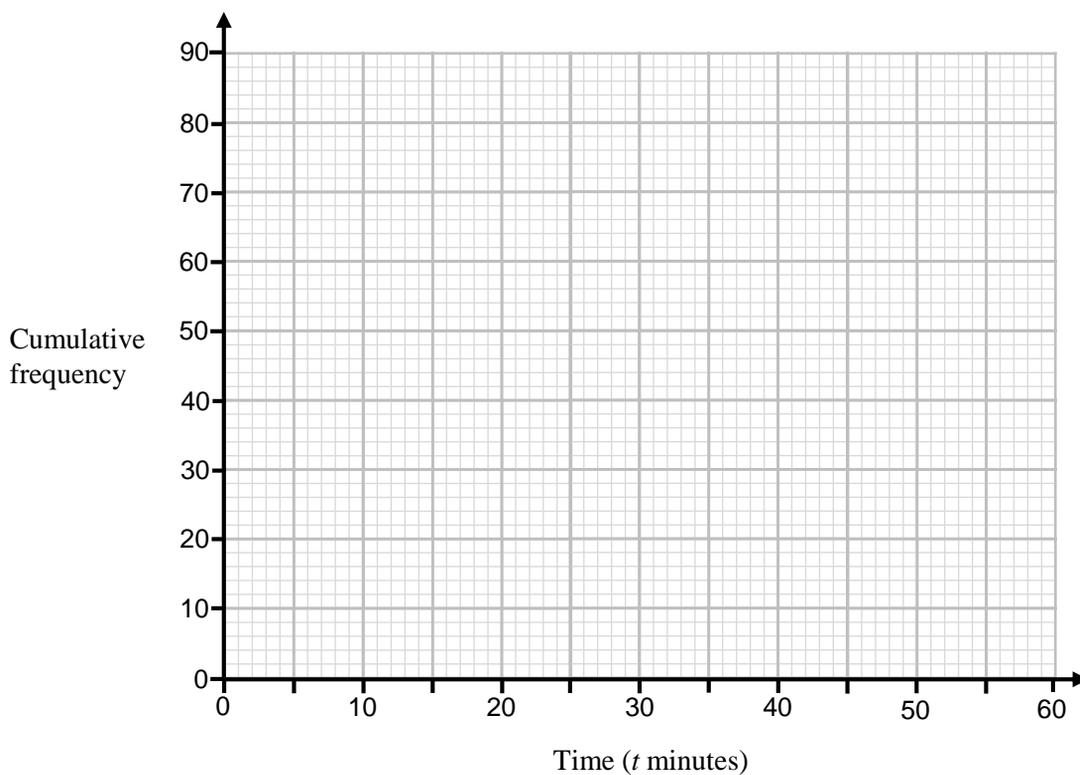
(Total for Question 10 is 3 marks)



11 The cumulative frequency table shows information about the times, in minutes, that 80 people spent shopping in a supermarket.

Time (t minutes)	Cumulative frequency
$10 < t \leq 20$	5
$10 < t \leq 30$	22
$10 < t \leq 40$	52
$10 < t \leq 50$	70
$10 < t \leq 60$	80

(a) On the grid below, draw a cumulative frequency graph for this information.



(2)

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11 (b) Use your graph to find an estimate for the interquartile range

.....
(2)

(Total for Question 11 is 4 marks)

12 A bag contains only green and blue counters.

A counter is taken from the bag and the colour noted. The counter is then returned to the bag.

A second counter is then taken.

The probability that both counters are green is $\frac{9}{25}$

Work out the probability that neither of the counters is green.

.....
(Total for Question 12 is 3 marks)

13 During a day 20 cats and 30 dogs visit a veterinary practice.

The mean mass of the cats is 4 kg.

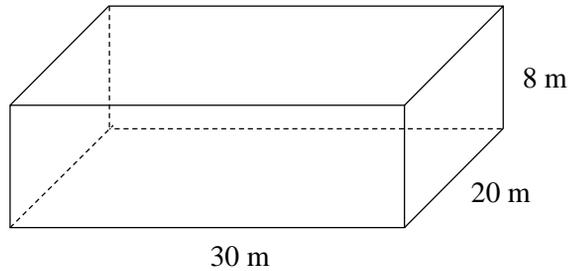
The mean mass of all the dogs and cats is 10 kg.

Work out the mean mass of the dogs.

..... kg

(Total for Question 13 is 3 marks)

14 The diagram shows a school sports hall that is a cuboid.



The four walls of the sports hall are to be painted.

The school buys tins of paint that will cover 75m^2 each.

Work out how many tins of paint the school needs to buy.

.....

(Total for Question 14 is 3 marks)





15 (a) Expand and simplify $(2x + 3)(x - 1)(x - 3)$

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(b) Simplify fully $\frac{2x^2 - 19x + 42}{x^2 - 36}$

.....

(3)

.....

(3)

(Total for Question 15 is 6 marks)



16 (a) Find the value of $8^{-\frac{4}{3}}$

.....
(2)

(b) Show that $\frac{\sqrt{27} + 2}{2\sqrt{3} + 1}$ can be written in the form $\frac{a + \sqrt{3}}{b}$ where a and b are integers.

.....
(4)

(Total for Question 16 is 6 marks)

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- 17 Express $0.\dot{4}\dot{7}$ as a fraction.
You must show all your working.

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.....
(Total for Question 17 is 3 marks)

- 18 A class of students are asked if they prefer English or science.

The ratio of males to females in a class is 3 : 5

The ratio of males who chose English to males who chose science is 3 : 1

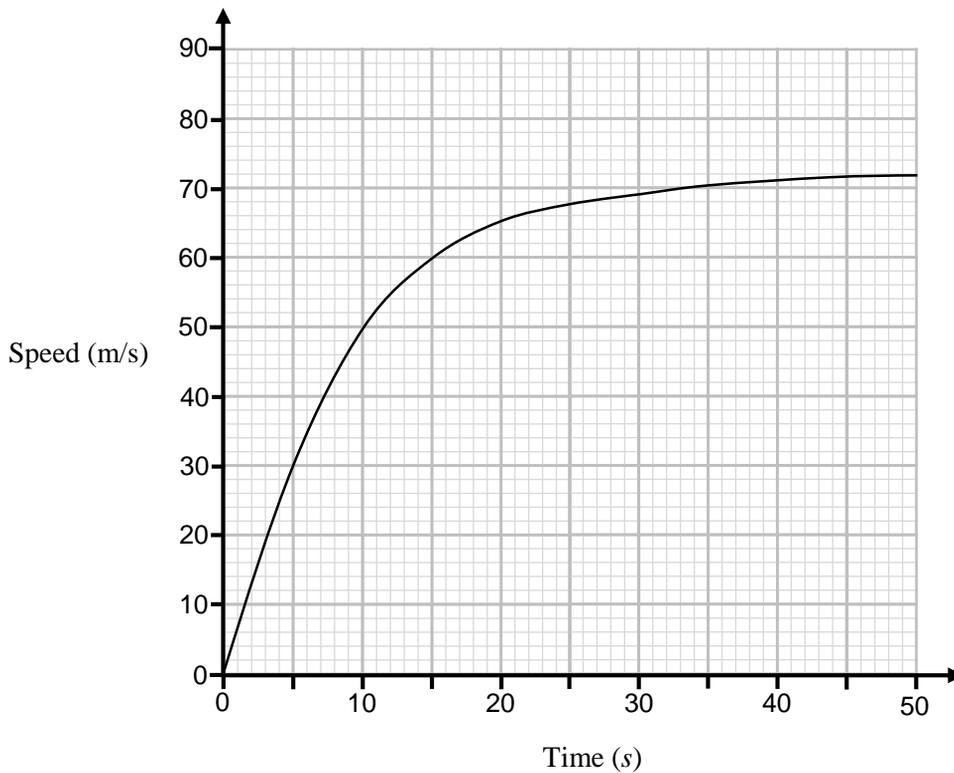
The ratio of females who chose English to females who chose science is 2 : 3

Work out what fraction of the class chose science.

.....
(Total for Question 18 is 3 marks)

19 A car moves from rest.

The graph gives information about the speed, v metres per second, of the car t seconds after it starts to move.



(a) Calculate an estimate of the gradient of the graph at $t = 20$

.....
(3)

(b) Michael says that the car is accelerating faster at $t = 20$ than at $t = 15$.
Explain why Michael is wrong.

.....
.....
.....
(1)

(Total for Question 19 is 4 marks)



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20 t is directly proportional to m^2

When $t = 2$, $m = 4$

m is inversely proportional to \sqrt{r}

When $m = 2$, $r = 9$

Find a formula for t in terms of r .

Give your answer in its simplest form.

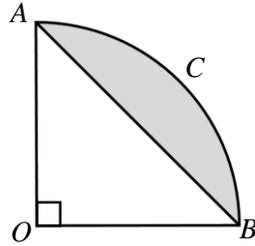
.....
(Total for Question 20 is 4 marks)

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21



The diagram shows a sector $OACB$ of a circle with centre O .
 $AB = \sqrt{72}$

Calculate the shaded area.
Give your answer in terms of π .

.....
(Total for Question 21 is 4 marks)

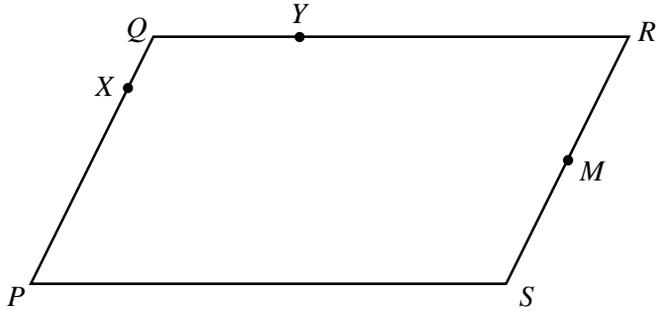
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22 $PQRS$ is a parallelogram.



$\vec{PS} = \mathbf{a}$ $\vec{PQ} = \mathbf{b}$

M is the midpoint of RS .

$QY : YR = 2 : 3$

XY and PM are parallel.

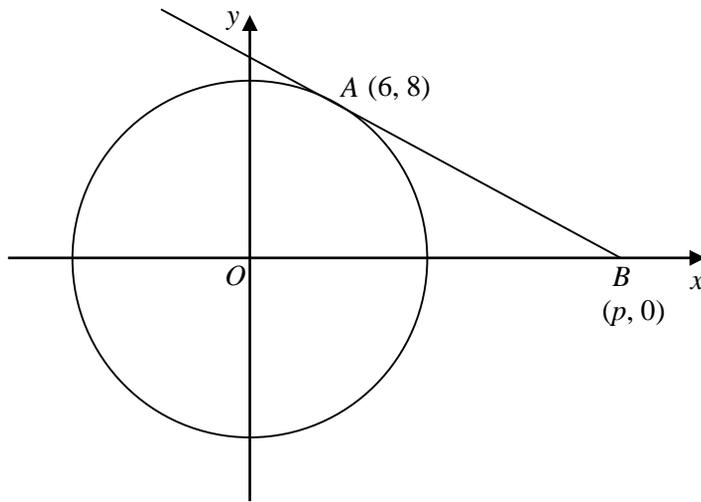
$PX : XQ = k : 1$

Find the value of k .

.....
(Total for Question 22 is 4 marks)

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23 The diagram shows a circle, centre O .



AB is tangent to the circle at point A .

A has the coordinates $(6, 8)$

B has the coordinates $(p, 0)$

Find the value of p .

.....
(Total for Question 23 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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