

Name:	Question	Mark	
Teacher:	1		
	2		
	3		
<p>Archway Learning Trust</p> <p>Mathematics Department</p> <p>Year 11 Mock 2 (February 2019)</p> <p>Higher Tier</p> <p>Paper 1</p> <p>Materials: For this paper you must have:</p> <ul style="list-style-type: none"> Mathematical instruments <p>You must not use a calculator</p> <p>Instructions:</p> <ul style="list-style-type: none"> Use black ink or black ball-point pen. Draw diagrams in pencil. Fill in the boxes at the bottom of this page. Answer all questions. You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages. Do all rough work in this book. In all calculations, show clearly how you work out your answer. <p>Information:</p> <ul style="list-style-type: none"> The marks for questions are shown in brackets. The maximum mark for this paper is 80. You may ask for more paper. 	4		
	5		
	6		
	7		
	8a,b,c		
	9		
	10		
	11		
	12		
	13		
	14		
	15a,b		
	16		
	17		
	18		
	19a,b		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27a,b		



Answer **all** questions in the spaces providedDo not write
outside the
box

- 1** Simplify $\left(5^4\right)^2$
Circle your answer.

[1 mark]

5^6

5^8

25^6

25^8

- 2** Circle the volume, in cm^3 , of a cylinder with radius 5 cm and height 8 cm

[1 mark]

40π

80π

200π

1600π

- 3** Simplify $16a^2 \div a + 3a \times 2$
Circle your answer.

[1 mark]

$22a$

$8a$

$38a$

$2a$

- 4 Circle the value of $\cos 30^\circ$

[1 mark]

$$\frac{1}{2}$$

$$\frac{\sqrt{3}}{2}$$

$$0$$

$$1$$

- 5 Work out $8\frac{1}{2} \div 2\frac{2}{3}$

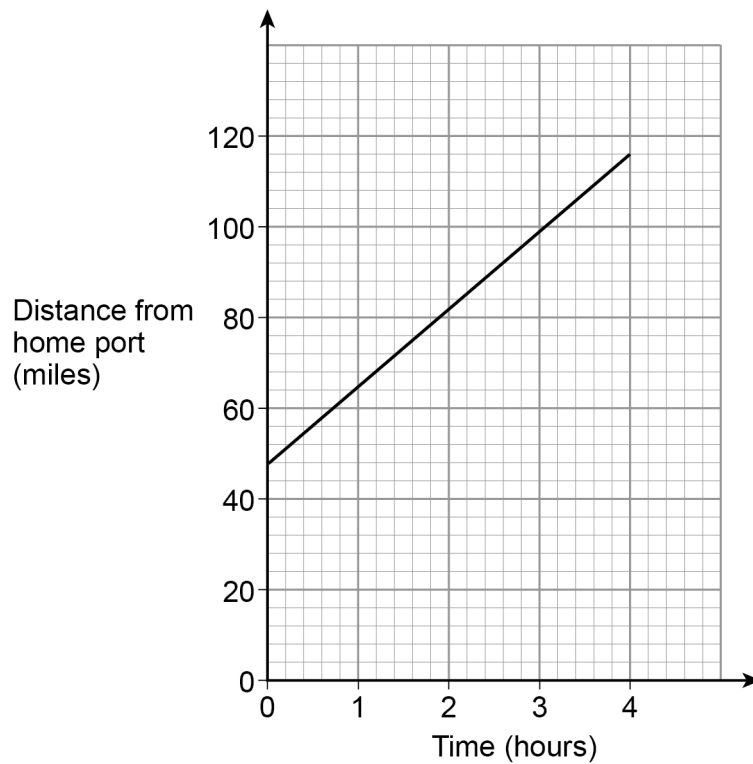
Give your answer as a mixed number.

[4 marks]

Answer _____

6

A ship is sailing in a straight line from its home port.
The distance-time graph shows 4 hours of the journey.



Work out the speed of the ship during these 4 hours.

[3 marks]

Answer _____ mph

7

The sum of the angles in any quadrilateral is 360°

For example, in a rectangle $4 \times 90^\circ = 360^\circ$

Zak writes,

$5 \times 90^\circ = 450^\circ$ so the sum of the angles in any pentagon must be 450°

Is he correct?

Tick a box.

☐

Yes

☐

No

Show working to support your answer.

[2 marks]

Turn over for the next question

- 8** Kim works at an airport in the UK.
She records the number of planes landing between 10 am and 2 pm each day.
The table shows the data for the first 10 days in January.

Day	1	2	3	4	5	6	7	8	9	10
Number of planes	148	151	147	155	153	147	155	102	151	154

- 8 (a)** The airport was affected by fog on one of the days.

Which day do you think it was?

Give a reason for your answer.

[1 mark]

Day _____

Reason _____

- 8 (b)** Kim uses the data to predict how many planes will land at the airport in a year.

In her method, she

uses an estimate of 150 planes in each 4-hour period throughout the day

assumes the same number of planes each day.

Work out her prediction.

[3 marks]

Answer _____

8 (c)

In fact,

fewer planes land in winter than in summer

fewer planes land at night than during the day.

What does this tell you about Kim's prediction?

Tick **one** box.☐

Her prediction is too low

☐

Her prediction is too high

☐

Her prediction could be too low or too high

Give a reason for your answer.

[2 marks]

Turn over for the next question

9

$$\sqrt{6^2 + 8^2} = \sqrt[3]{125a^3}$$

Work out the value of a .**[4 marks]**

Answer _____

10

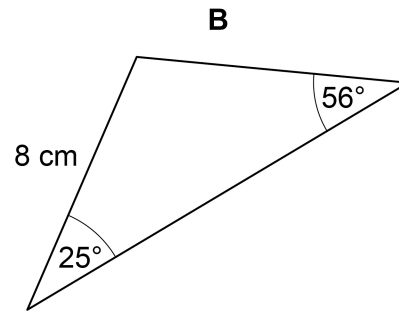
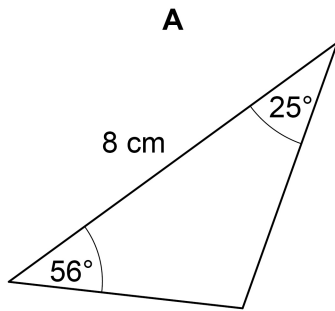
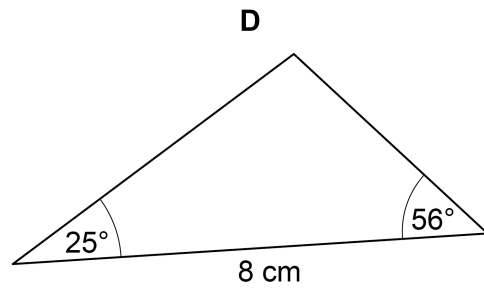
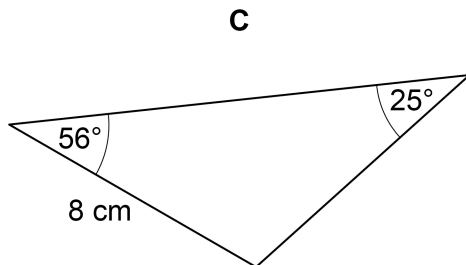
Work out the percentage increase from 80 to 280

[3 marks]

Answer _____ %

11

Here are four triangles.

Not drawn
accurately

Which **two** triangles are congruent?
Circle **two** letters below.

[1 mark]

A

B

C

D

Turn over for the next question

12 Solve $x^2 - x - 12 = 0$

[3 marks]

Answer _____

13 $e : f = 2 : 3$ and $f : g = 5 : 4$

Work out $e : g$

Give your answer in its simplest form.

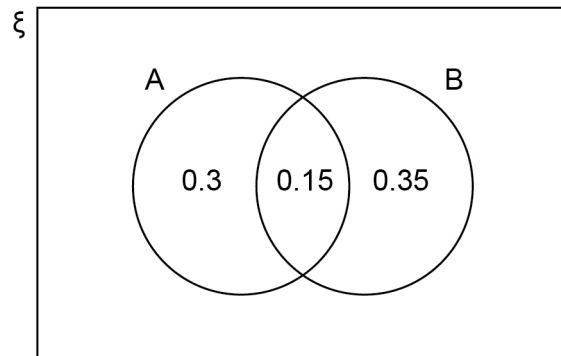
[3 marks]

Answer _____ : _____

14

A and B are two events.

Some probabilities are shown on the Venn diagram.

Work out $P(A' \cup B)$ **[2 marks]**

Answer _____

Turn over for the next question

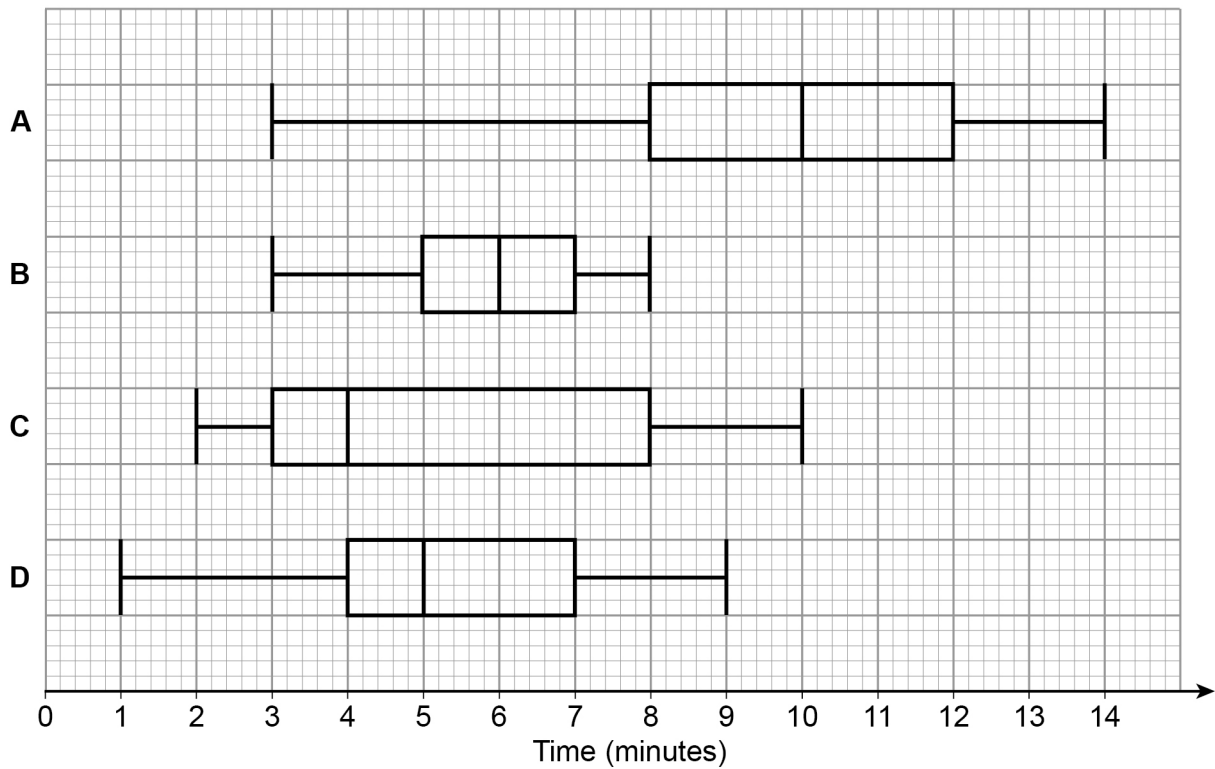
15

In a survey, queuing times at supermarket checkouts were recorded.

One morning, samples of 50 customers were taken at supermarkets A, B, C and D.

The box plots represent the results.

Queuing times



15 (a) On average, which supermarket had the lowest queuing times?

Give a reason for your answer.

[2 marks]

Supermarket _____

Reason _____

- 15 (b)** At which supermarket were the queuing times most consistent?
Give a reason for your answer.

[2 marks]

Supermarket _____

Reason _____

- 16** Circle the number that is closest to the value of 29^3

[1 mark]

27 000

90

2700

9000

- 17** Work out the exact value of $\left(\frac{3}{4}\right)^{-3}$

[2 marks]

Answer _____

Turn over for the next question

18

Beth and Mia translate documents from Spanish into English.

A set of documents that would take Beth 8 days would take Mia 10 days.

Beth starts to translate the documents.

After 2 days Beth and Mia both work on translating the documents.

How many **more** days will it take to complete the work?

You **must** show your working.

[4 marks]

Answer _____ days

19 In a chess club, there are x boys and y girls.

19 (a) If 5 more boys and 8 more girls join, there would be half as many boys as girls.

Show that $y = 2x + 2$

[2 marks]

19 (b) If instead,
10 more boys and 1 more girl join, there would be the same number of boys and girls.

Work out x and y .

[3 marks]

$x =$ _____

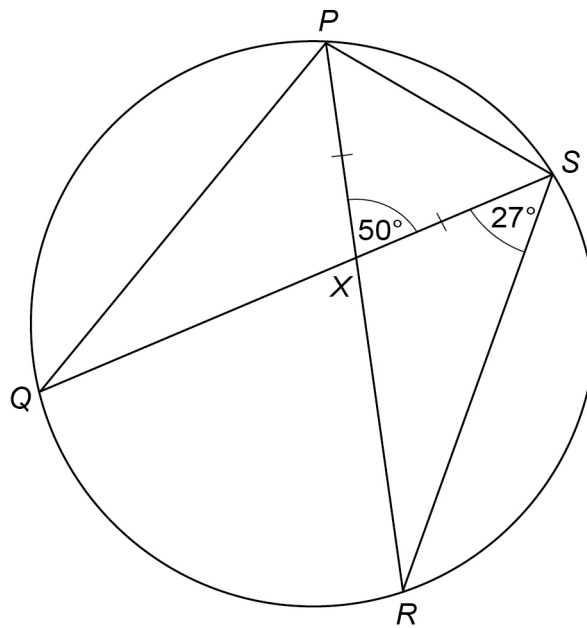
$y =$ _____

20

P , Q , R and S are points on a circle.

PXR and QXS are straight lines.

$PX = SX$



Not drawn
accurately

Prove that QS is **not** a diameter of the circle.

[4 marks]

Here are the first four terms of a quadratic sequence.

68

[3 marks]

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

Answer _____

Turn over for the next question

22

Solve $\frac{x}{x+4} + \frac{7}{x-2} = 1$

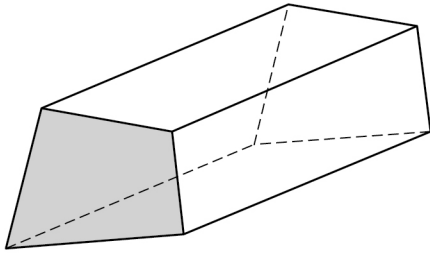
You **must** show your working.

[4 marks]

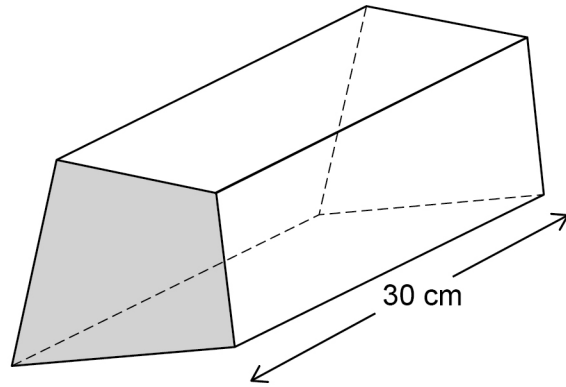
$x =$ _____

23

Prisms A and B are similar.
The cross sections are shaded.

Prism Avolume = 480 cm^3 **Prism B**

length = 30 cm



area of the cross section of A : area of the cross section of B = 4 : 9

Work out the area of the cross section of B.

[5 marks]

Answer _____ cm^2

24

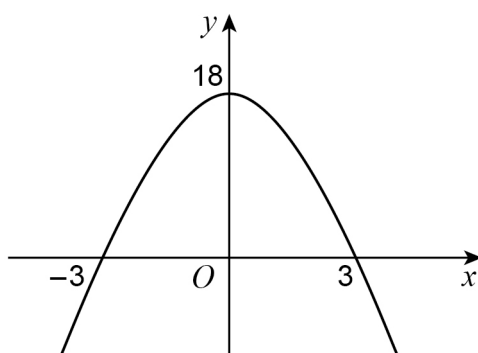
Show that $\frac{2\sqrt{6}}{\sqrt{5}} - \frac{\sqrt{3}}{\sqrt{10}}$ can be written in the form $\frac{c\sqrt{d}}{10}$

where c and d are integers.

[3 marks]

25

A quadratic curve intersects the axes at $(-3, 0)$, $(3, 0)$ and $(0, 18)$



Not drawn
accurately

Work out the equation of the curve.

[3 marks]

Answer _____

Turn over for the next question

The area of this triangle is $25\sqrt{3} \text{ cm}^2$

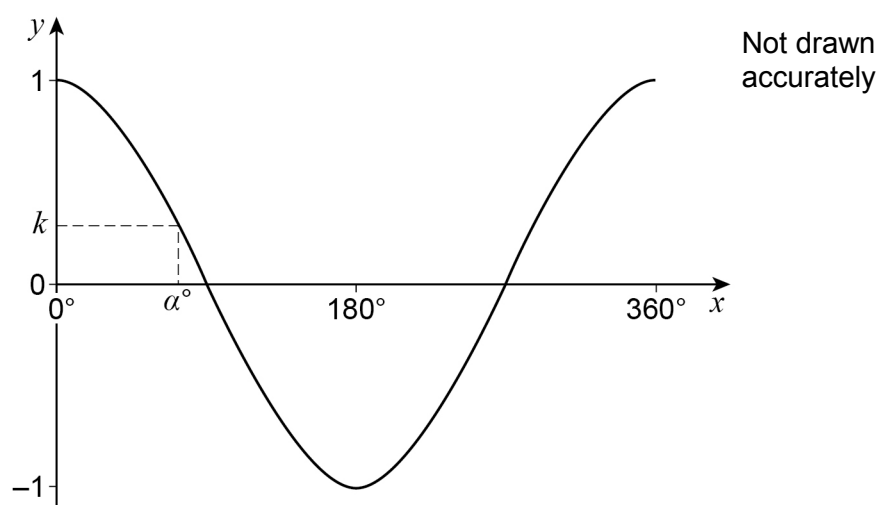
A triangle is shown with a horizontal base of 20 cm. The left side is labeled w cm and the right side is labeled x cm. The interior angle at the bottom right vertex is labeled 60° .

Give your answer in the form $a\sqrt{b}$ where a and b are integers greater than 1

[illegible]

Answer _____

- 27** Here is a sketch of $y = \cos x$ for values of x from 0° to 360°



α° is an acute angle.

$$\cos \alpha^\circ = k$$

- 27 (a)** Circle the value of $\cos (180^\circ - \alpha^\circ)$

[1 mark]

$1 - k$

k

$-k$

$-1 - k$

- 27 (b)** Circle the value of $\cos (360^\circ + \alpha^\circ)$

[1 mark]

$k - 1$

$k + 1$

$-k$

k

END OF QUESTIONS

There are no questions printed on this page

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outside the
box*

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