

Please write clearly, in block capitals.

Centre number

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Candidate number

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Surname

Forename(s)

Candidate signature

OXFORD AQA INTERNATIONAL GCSE MATHEMATICS EXTENSION

PAPER 1E (9260/1E)

Specimen 2018

Morning

Time allowed: 2 hours

Materials

For this paper you must have:

- a calculator
- mathematical instruments.



Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the space provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 100
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

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

- 1** Circle the equation with roots 4 and -8

[1 mark]

$$4x(x - 8) = 0$$

$$(x - 4)(x + 8) = 0$$

$$x^2 - 32 = 0$$

$$(x + 4)(x - 8) = 0$$

- 2** A menu has a choice of 3 starters, 5 main courses and 4 desserts.

How many different choices of a 3-course meal are possible?

Circle your answer.

[1 mark]

12

23

60

972

- 3** $f(x) = 3x$

Circle the expression for $f^{-1}(x)$

[1 mark]

$-3x$

$\frac{3}{x}$

$\frac{1}{3x}$

$\frac{x}{3}$

4 $\mathbf{a} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Circle the vector $\mathbf{a} - \mathbf{b}$

[1 mark]

$$\begin{pmatrix} -3 \\ -5 \end{pmatrix}$$

$$\begin{pmatrix} 7 \\ 1 \end{pmatrix}$$

$$\begin{pmatrix} 3 \\ 1 \end{pmatrix}$$

$$\begin{pmatrix} 7 \\ -5 \end{pmatrix}$$

5 Solve $5(x + 4) = 3(x + 7) + 2$

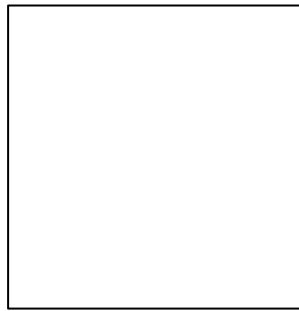
[4 marks]

$x =$ _____

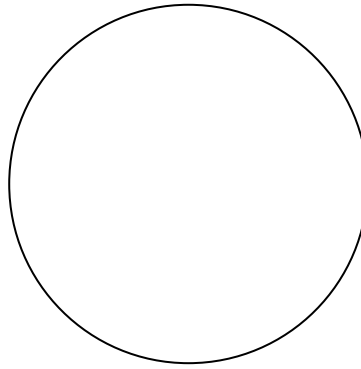
6

A square of side 15.7 cm is made from a length of wire.

The same length of wire is then made into a circle.



← 15.7 cm →



Not drawn
accurately

Work out the diameter of the circle.

[4 marks]

Answer _____ cm

7 Written as the product of its prime factors $672 = 2^5 \times 3 \times 7$

7 (a) Write 252 as the product of its prime factors.

[2 marks]

Answer _____

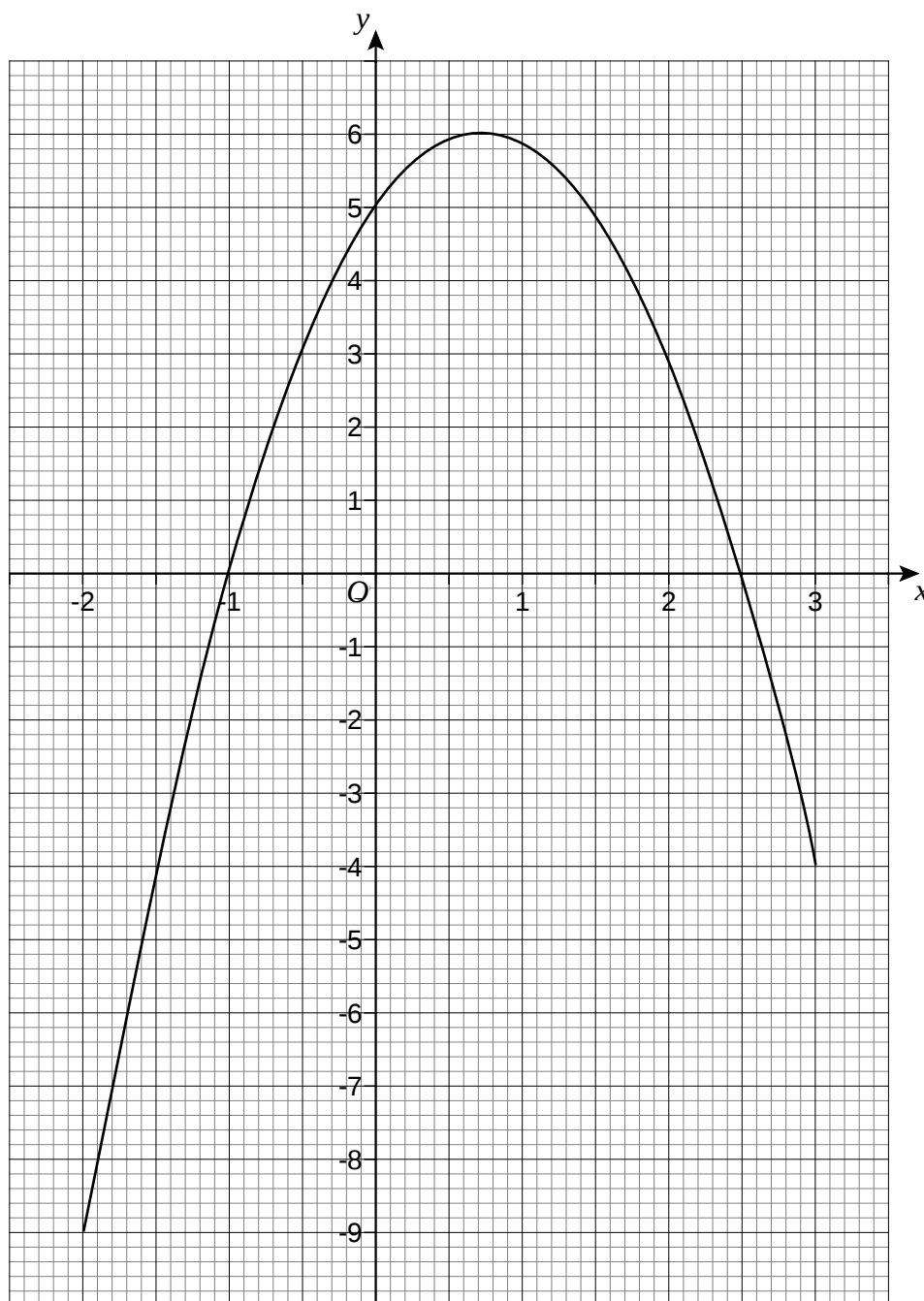
7 (b) Work out the value of the highest common factor of 672 and 252

[1 mark]

Answer _____

8

The graph of $y = 5 + 3x - 2x^2$ is shown for values of x from -2 to 3



Write down the solutions of $5 + 3x - 2x^2 = 0$

[2 marks]

Answer _____ and _____

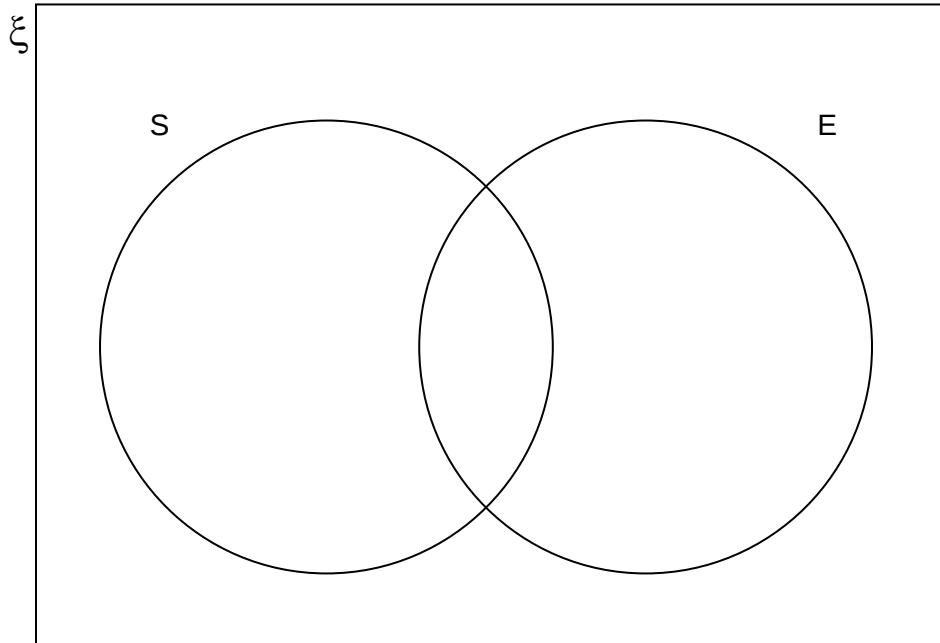
9 $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$

S = square numbers

E = even numbers

9 (a) Complete the Venn diagram.

[3 marks]



9 (b) One of the numbers is chosen at random.

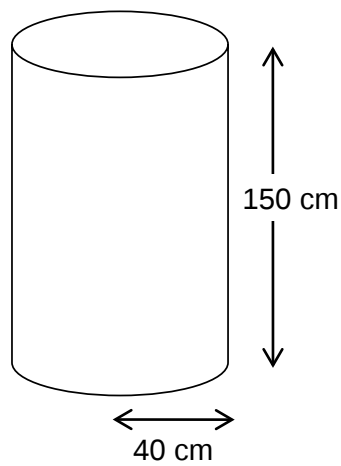
Write down $P(S \cap E)$

[1 mark]

Answer _____

10

A water tank is a cylinder with radius 40 cm and depth 150 cm



Not drawn
accurately

It is filled at the rate of 0.2 litres per second.

1 litre = 1000 cm³

Does it take longer than 1 hour to fill the tank?

You **must** show your working.

[4 marks]

Answer _____

- 11 (a)** Use your calculator to work out $19.42^2 - \sqrt[3]{1006} \div 4.95$

Write down your full calculator display.

[1 mark]

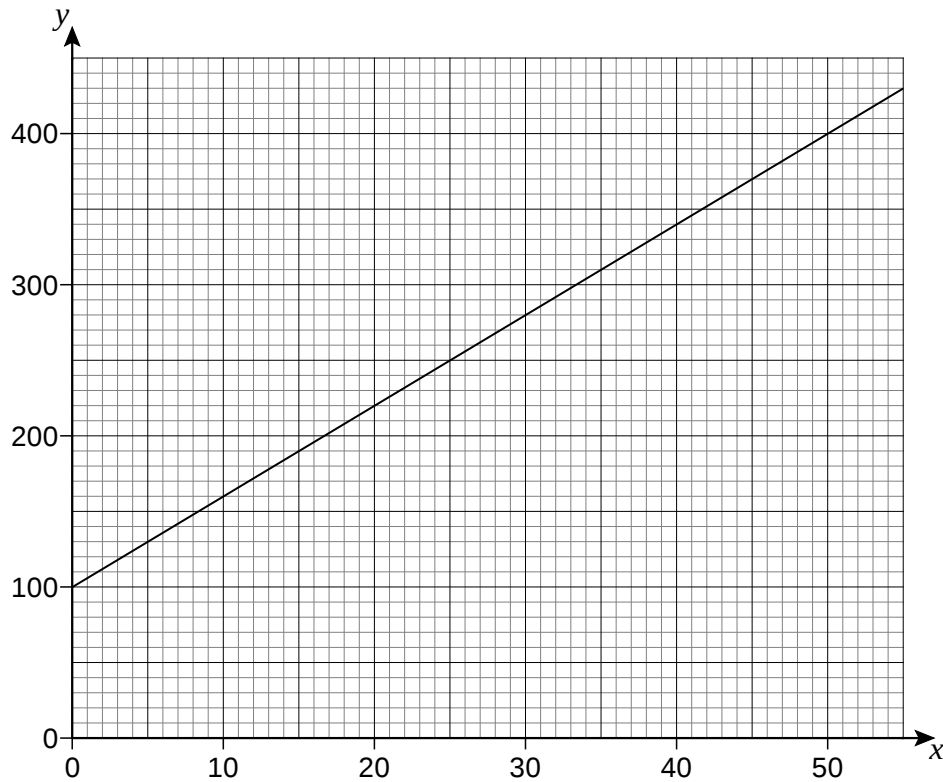
Answer _____

- 11 (b)** Use approximations to check your answer to part (a) is sensible.
You **must** show your working.

[2 marks]

12

The graph shows the line $y = ax + b$



Work out the values of a and b .

[2 marks]

$a =$ _____

$b =$ _____

13

White paint costs \$2.80 per litre.

Blue paint costs \$3.50 per litre.

White paint and blue paint are mixed in the ratio 3 : 2

Work out the cost of 20 litres of the mixed paint.

[4 marks]

Answer \$ _____

- 14** The table shows the masses of three planets.

	Mass (kg)
Mars	6.42×10^{23}
Earth	5.98×10^{24}
Jupiter	1.90×10^{27}

- 14 (a)** How many times heavier is Jupiter than Earth?

[1 mark]

Answer _____

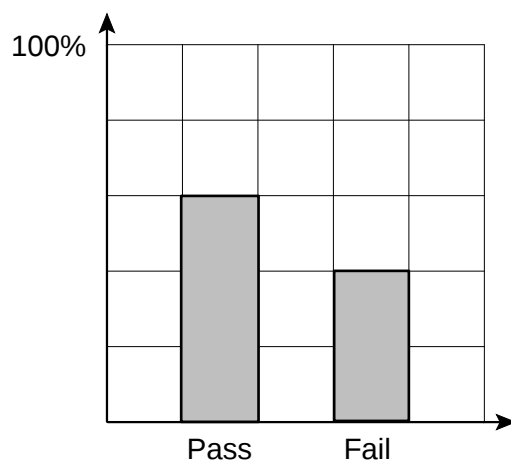
- 14 (b)** Work out the difference in masses between Earth and Mars.
Give your answer in standard form correct to 3 significant figures.

[2 marks]

Answer _____

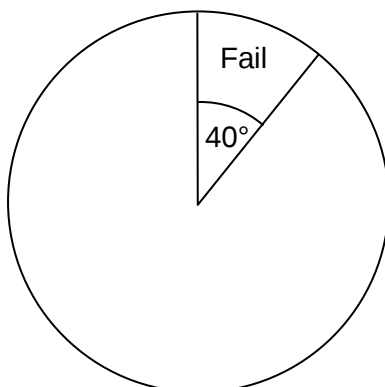
15 Some students take a cycling test.

The percentage bar chart shows the results.



The students who fail the test take it a second time.

The pie chart shows these results.



Two students fail the second test.

How many students pass the test first time?

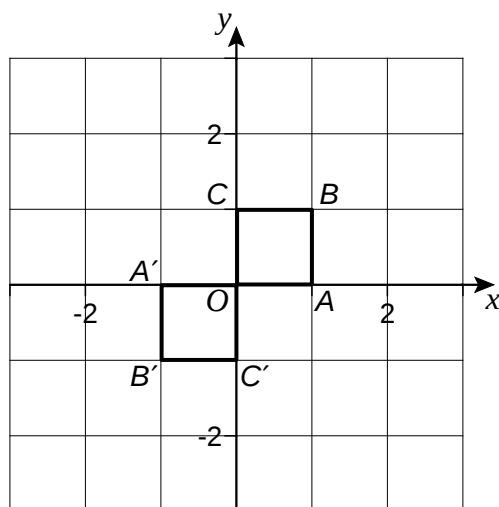
[4 marks]

Answer _____ students

16 The unit square $OABC$ has vertices

$$O(0, 0) \quad A(1, 0) \quad B(1, 1) \quad C(0, 1)$$

16 (a) $OABC$ is mapped to $OA'B'C'$ under the transformation matrix $\mathbf{M}$.



Work out the matrix $\mathbf{M}$.

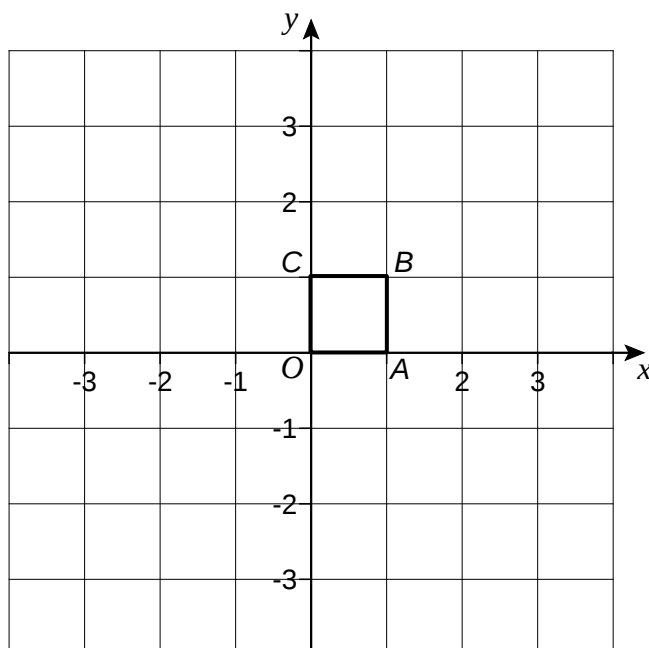
[2 marks]

Answer _____

- 16 (b)** $OABC$ is mapped to $OA''B''C''$ under the transformation matrix $\begin{pmatrix} -3 & 0 \\ 0 & -3 \end{pmatrix}$

Draw and label $OA''B''C''$ on the diagram below.

[3 marks]



Turn over for the next question

17 (a) Simplify fully $\frac{8c^7}{15d^6} \div \frac{6c^2}{15d^3}$

[3 marks]

Answer _____

17 (b) Write as a single fraction $\frac{5}{m+1} + \frac{6}{m-4}$

Give your answer in its simplest form.

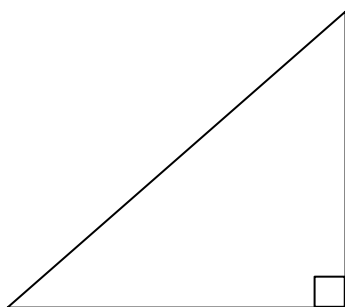
[4 marks]

Answer _____

18

The area of a **right-angled, isosceles** triangle is 4 cm^2

Not drawn
accurately



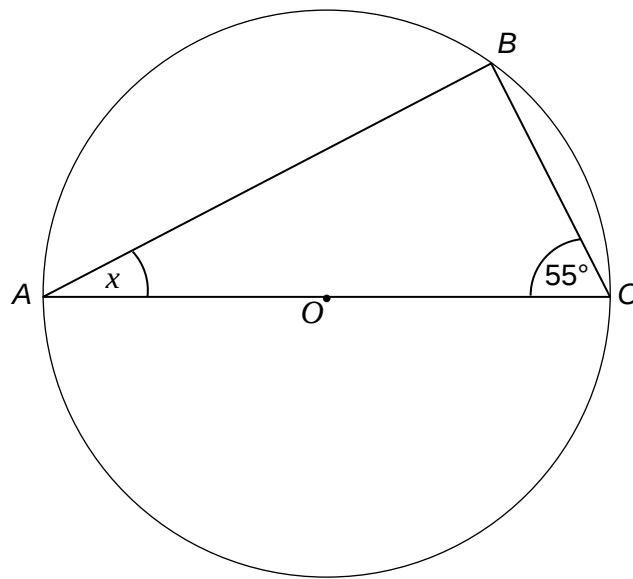
Work out the perimeter of the triangle in centimetres.

Give your answer in the form $a + b\sqrt{c}$, where a , b and c are integers.

[5 marks]

Answer _____ cm

- 19 (a)** A , B and C are points on the circumference of a circle with centre O .



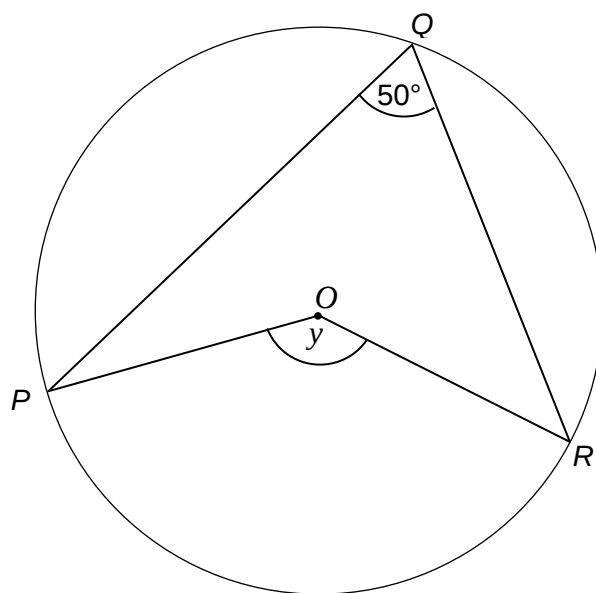
Not drawn
accurately

Work out the size of angle x .

[1 mark]

Answer _____ degrees

- 19 (b)** P , Q and R are points on the circumference of a circle with centre O .



Not drawn
accurately

Work out the size of angle y .
Give a reason for your answer.

[2 marks]

Answer _____ degrees

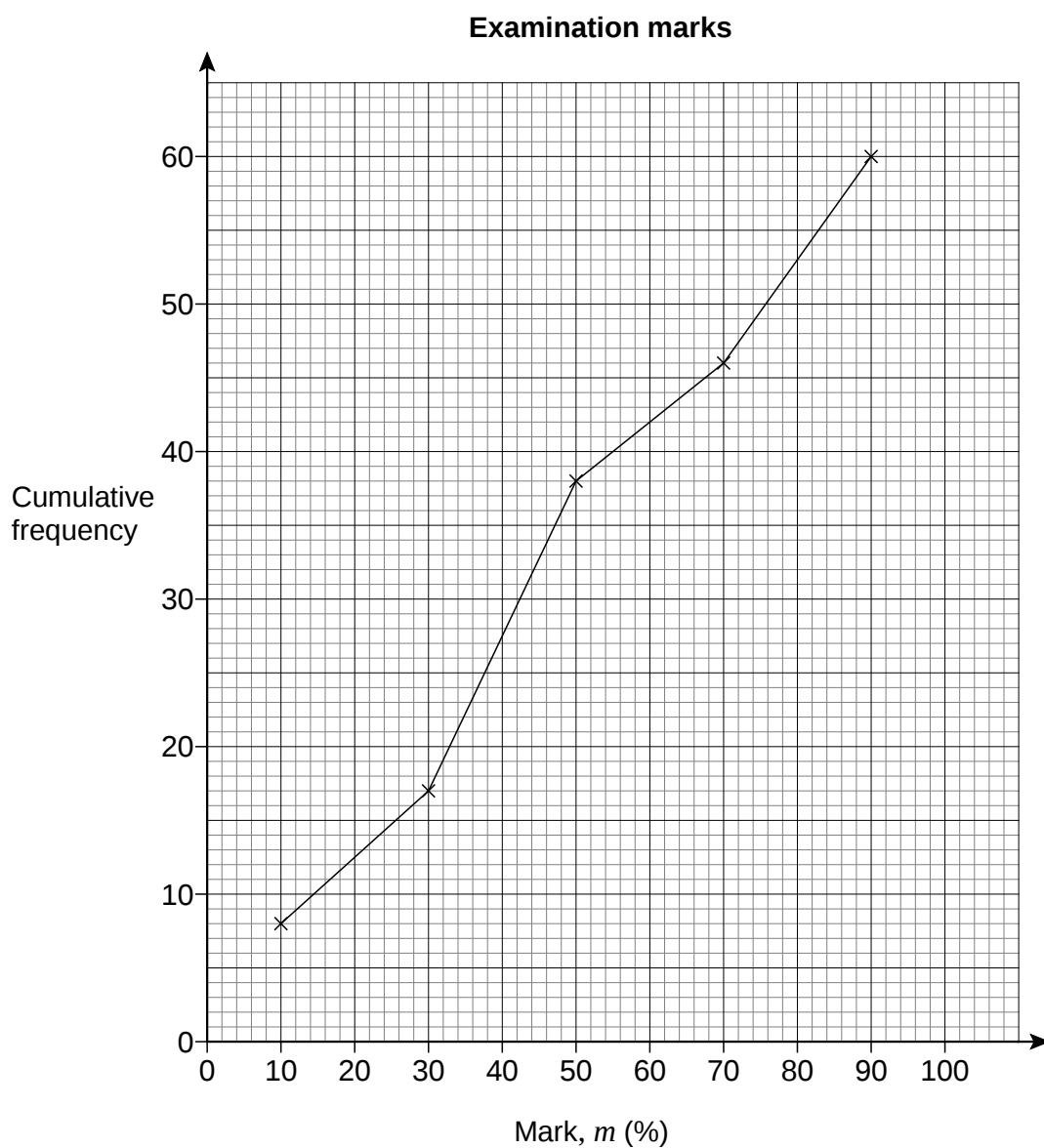
Reason _____

20

Here are the examination marks for 60 pupils.

Mark, m (%)	Frequency
$0 \leq m < 20$	8
$20 \leq m < 40$	9
$40 \leq m < 60$	21
$60 \leq m < 80$	10
$80 \leq m < 100$	12

Molly drew this cumulative frequency graph to show the data.



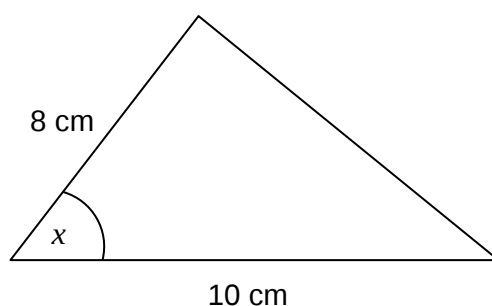
Make **two** criticisms of Molly's graph.

[2 marks]

Criticism 1 _____

Criticism 2 _____

21 Which expression gives the area, in cm^2 , of this triangle?



Not drawn
accurately

Circle your answer.

[1 mark]

$80 \sin x$

$40 \sin x$

$80 \cos x$

$40 \cos x$

22 The square of x is 7

Circle the value of x^3

[1 mark]

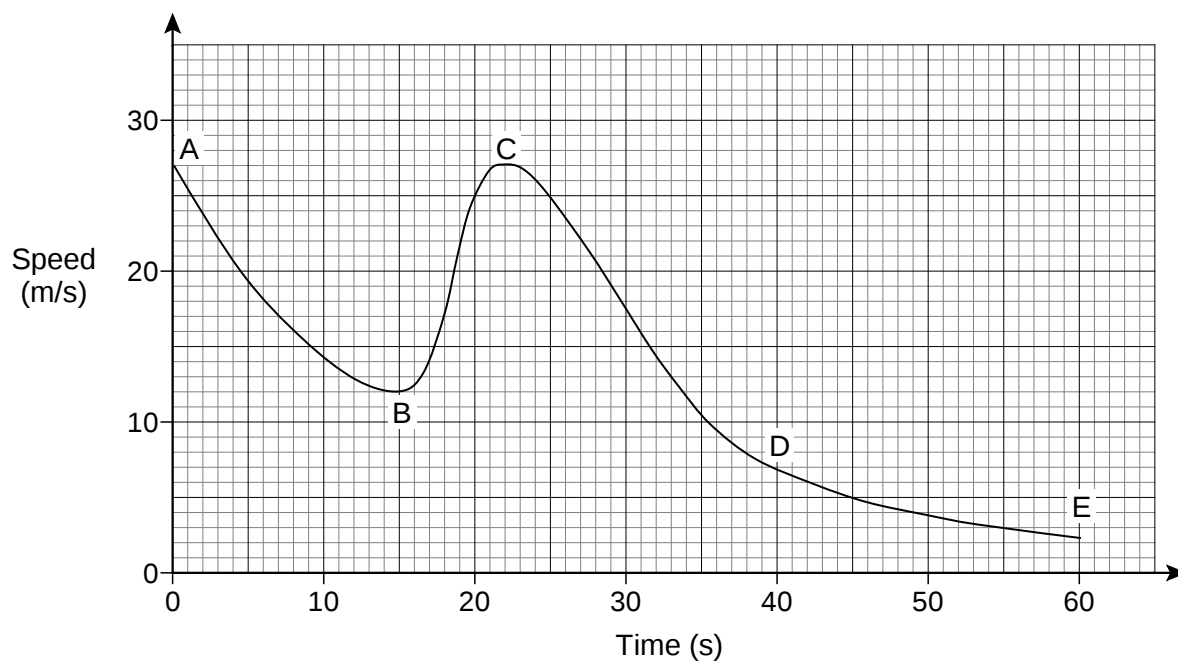
343

$\sqrt[3]{49}$

117 649

$7\sqrt{7}$

23 (a) The diagram shows the speed-time graph of a car for 60 seconds.



Which **two** points on the graph show when the car has an acceleration of zero?
Circle your answers.

[1 mark]

A

B

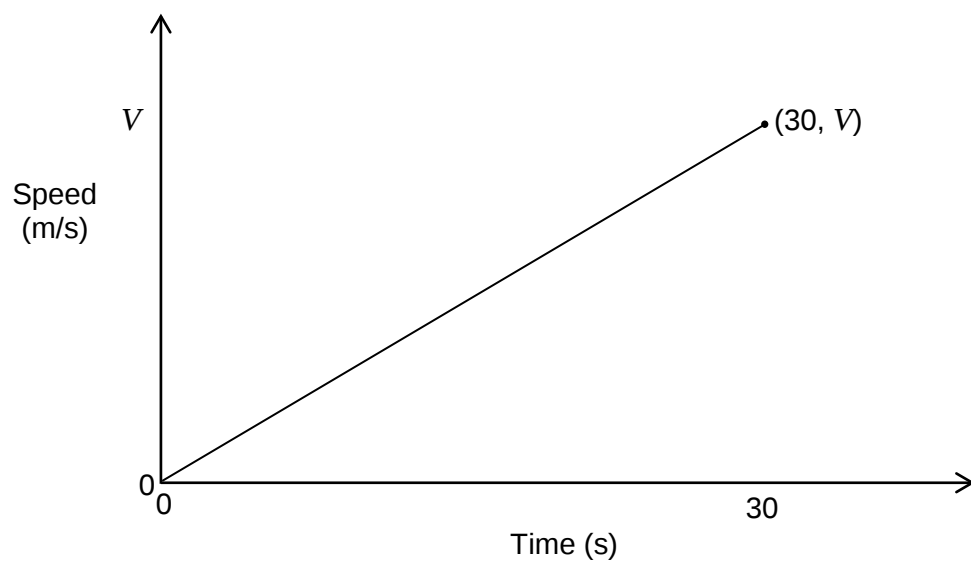
C

D

E

23 (b) This diagram shows the speed-time graph of a lorry for 30 seconds.

After 30 seconds the speed of the lorry is V m/s



The lorry travels a distance of 270 metres in 30 seconds.

Work out V .

[2 marks]

$V =$ _____ m/s

24 Solve $x^2 + 6x + 2 = 0$

Give your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

[4 marks]

Answer _____

25

Simplify

$$\frac{x^2 - 16}{2x^2 - 5x - 12}$$

[3 marks]

Answer _____

26

 Rationalise the denominator of $\frac{8}{3 - \sqrt{5}}$

 Give your answer in the form $a + b\sqrt{5}$ where a and b are integers.

[3 marks]

Answer _____

27

A bag contains 9 counters.

4 of the counters are blue.

Two counters are taken out of the bag at random, without replacement.

Calculate the probability that **at least one** of the two counters is blue.

[4 marks]

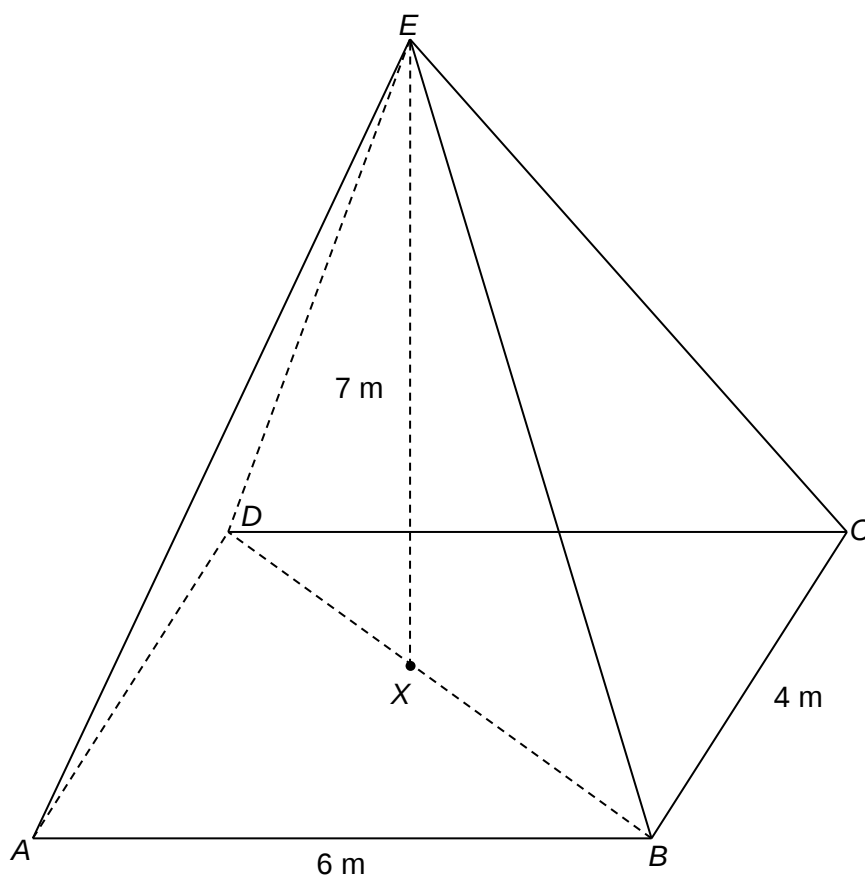
Answer _____

28

A tent is in the shape of a pyramid with a horizontal rectangular base $ABCD$.

The vertex, E , is directly above X , the centre of the base.

The height of the pyramid is 7 m



Work out the size of the angle that EB makes with $ABCD$.

[4 marks]

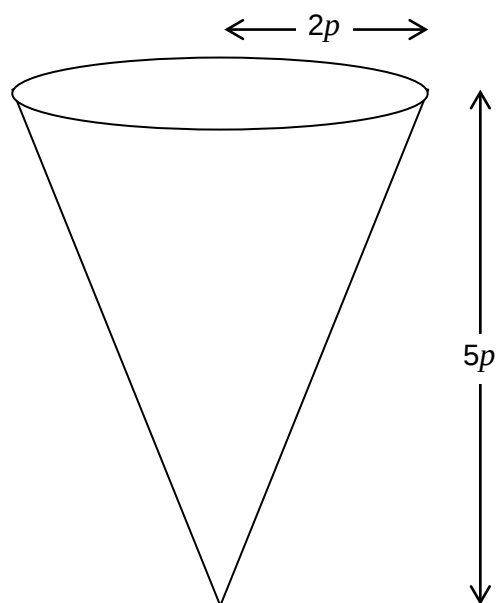
Answer _____ degrees

29

This right circular cone has radius $2p$ and height $5p$.

The dimensions are in centimetres.

The volume of the cone is $22\,500\pi \text{ cm}^3$



Volume of a cone = $\frac{1}{3} \times \text{area of base} \times \text{perpendicular height}$

Work out the value of p .

[4 marks]

Answer $p =$ _____

30

Work out all of the solutions for x and y if $\begin{pmatrix} x & 3 \\ 1 & y \end{pmatrix} \begin{pmatrix} x \\ -4 \end{pmatrix} = \begin{pmatrix} 4x \\ 8 \end{pmatrix}$

[5 marks]

Answer _____

31

The curve $y = x^3 + bx + c$ has a stationary point at $(-2, 20)$

Work out the values of b and c .

[5 marks]

[illegible]
$$b =$$
$$C =$$

END OF QUESTIONS.

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