AQA

Please write clearly, in block capitals.

Centre number ☐☐☐☐☐   Candidate number ☐☐☐☐

Surname _____

Forename(s) _____

Candidate signature _____

GCSE
MATHEMATICS

H

Higher Tier   Paper 2 Calculator

Time allowed: 1 hour 30 minutes

Materials

For this paper you must have**:**
- mathematical instruments
- a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- 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. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2 - 3	
4 - 5	
6 - 7	
8 - 9	
10 - 11	
12 - 13	
14 - 15	
16 - 17	
18 - 19	
20	
TOTAL	

1 Three of the angles of a quadrilateral are 100°, 100° and 80°

1 (a) Work out the size of the 4th angle.

[1 mark]

_____

_____

Answer _____

1 (b) Write down a possible name for this quadrilateral.

[1 mark]

Answer _____

2 Write down an improper fraction equivalent to 1.375

[1 mark]

_____

Answer _____

3 Write down the equation of the x-axis

[1 mark]

_____

Answer _____

4   Write 300 as a product of its prime factors.

[2 marks]

Answer _____

5   60 people took a test.

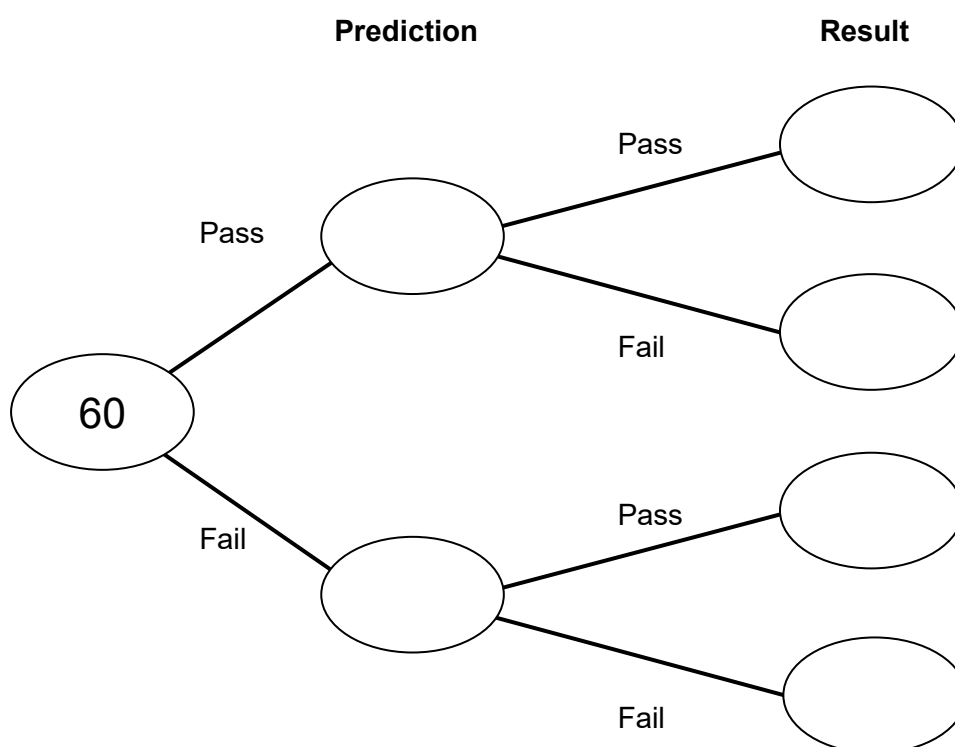Before the test, they predicted whether they would pass or fail.

40 people predicted they would pass.

51 people did pass.

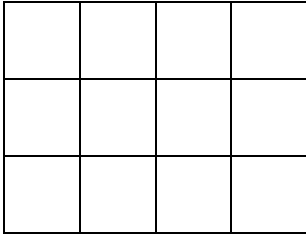Of these 51 people, the ratio that predicted pass to fail was 2:1

Complete the frequency tree.
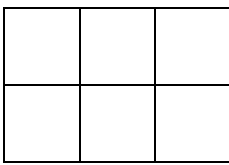
[3 marks]

Turn over ▶

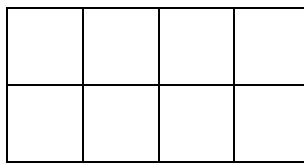**6** A solid cuboid is made from **centimetre cubes**.

The plan view, front elevation and side elevation are shown.

Plan view

Front elevation   Side elevation

How many cubes were used to make the cuboid?

[2 marks]

Answer _____

7 The times that 60 customers waited at a supermarket checkout are shown.

Time, t (minutes)	Frequency
$0 \leqslant t < 2$	18
$2 \leqslant t < 4$	10
$4 \leqslant t < 6$	16
$6 \leqslant t < 8$	12
$8 \leqslant t < 10$	4

7 (a) Write down the class interval that contains the median.

[1 mark]

Answer _____

7 (b) The manager of the supermarket says,

"Over 90% of our customers wait less than eight minutes."

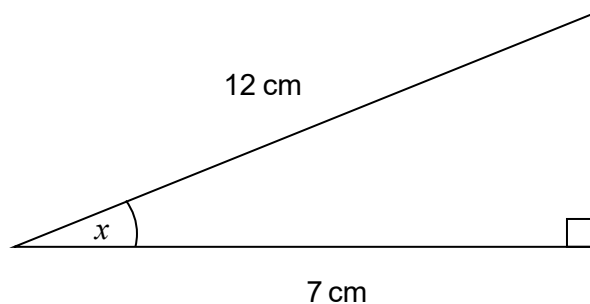Does the data support this statement?

Yes. ☐   No ☐

You **must** show your working.
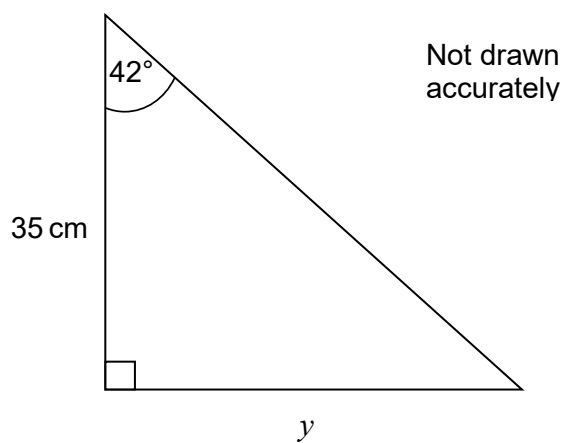
[2 marks]

8 (a) Work out the size of angle x

[3 marks]

12 cm

Not drawn accurately

x

7 cm

Answer _____ degrees

8 (b) Work out length y

[3 marks]

42°

Not drawn accurately

35 cm

y

Answer _____ cm

9 Expand and simplify $(y + 8)(y - 3)$

[2 marks]

Answer _____

10 Tomas ran a Lucky Dip stall.

> **LUCKY DIP**
>
> Tickets 50p
>
> Tickets ending 88 win £10
> Tickets ending 9 win £2

There were 800 tickets, numbered 1 to 800

Tomas sold **all** the winning tickets, and **some** of the losing tickets.
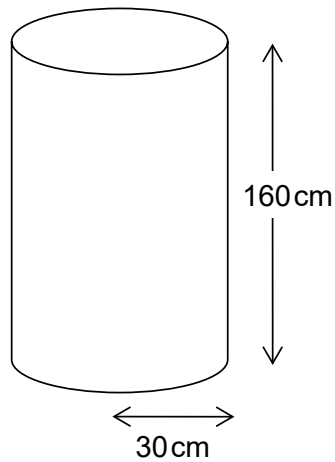
He made a profit of £155

How many **losing** tickets did he sell?

[5 marks]

Answer _____

11 A water tank is a cylinder with radius 30 cm and depth 160 cm.

160 cm

30 cm

It is filled at the rate of 0.1 litres per second.

1 litre $= 1000$ cm^3

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

You **must** show your working.

[4 marks]

Answer _____

12 Work out the equation of the line that

is parallel to the line $\quad y = 4x - 1$

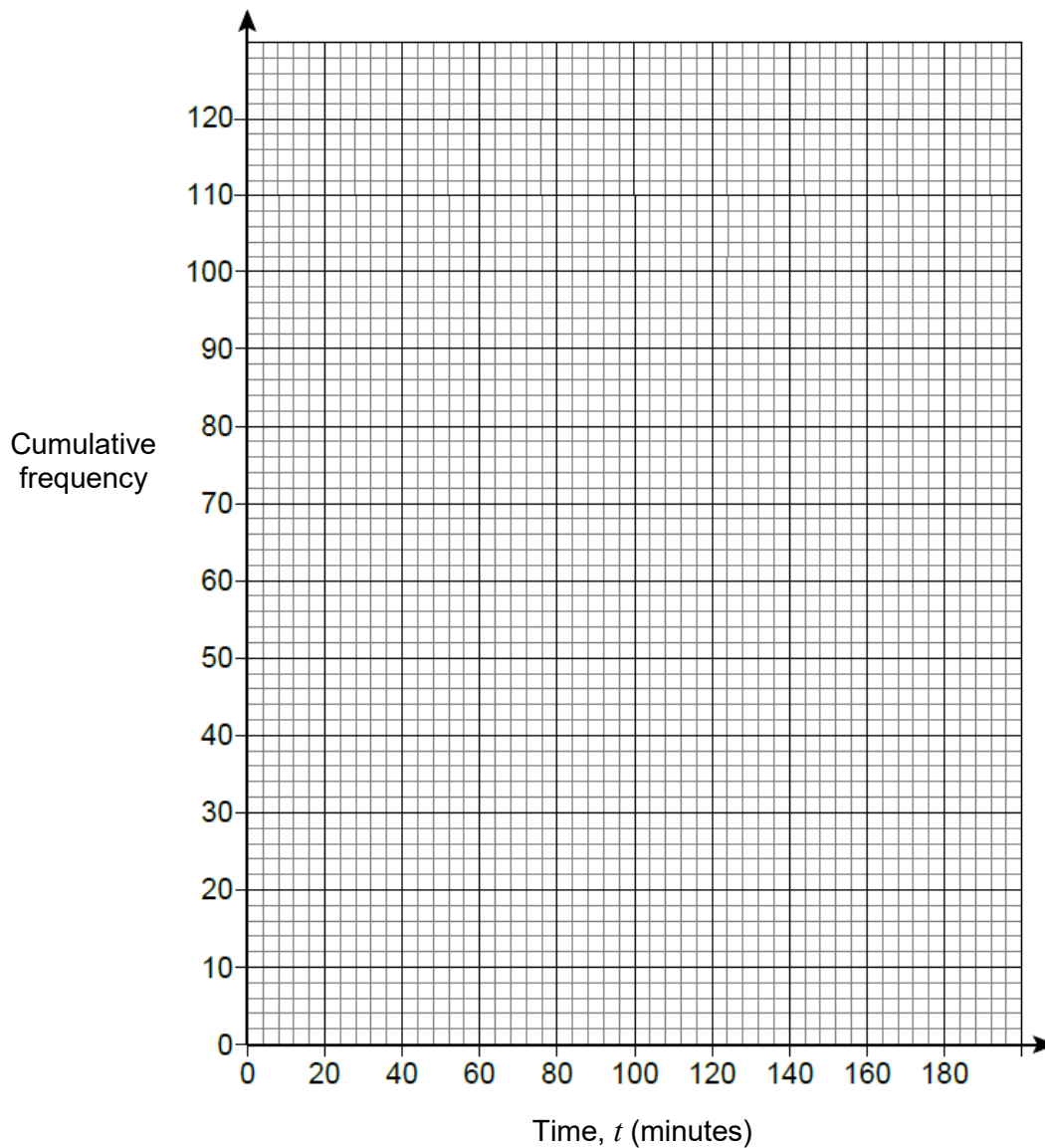passes through $\quad\quad (-1, 1)$

[3 marks]

Answer _____

Turn over for the next question

7

Turn over ▶

13 The table shows the running times of some films.

Time, t (minutes)	Number of films
$0 \leqslant t < 80$	0
$80 \leqslant t < 100$	12
$100 \leqslant t < 120$	38
$120 \leqslant t < 140$	36
$140 \leqslant t < 160$	24
$160 \leqslant t < 180$	10

13 (a) Draw a cumulative frequency graph on the grid below to represent the data.

[3 marks]

Cumulative frequency

Time, t (minutes)

13 (b) Estimate the number of these films with a running time of less than 130 minutes.

[1 mark]

Answer _____

14 Sophie sells birthday cards.

She adds 40% profit to the cost price.

She sells the cards for £2.66 each.

She wants to increase her profit to 50% of the cost price.

How much should she sell each card for?

[3 marks]

Answer £ _____

15 $(7 \times 10^a) + (7 \times 10^b) + (7 \times 10^c) = 7070.07$

Write down a possible set of values of a, b and c.

[3 marks]

$a =$ _____ $b =$ _____ $c =$ _____

10

Turn over ▶

16 g is directly proportional to y

g is inversely proportional to x^3

16 (a)   When $y = 6$, $g = 27$

Work out the value of g when $y = 9$

[2 marks]

Answer _____

16 (b)   When $x = 2$, $g = 25$
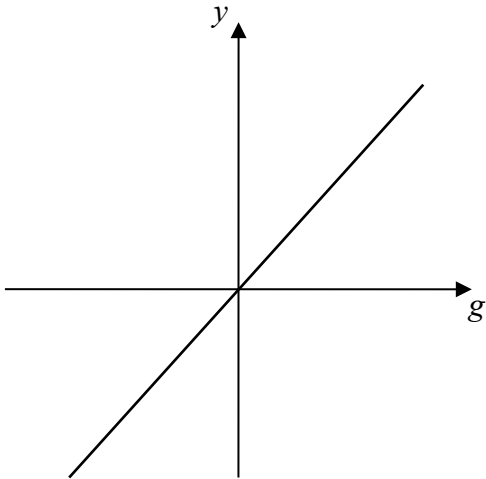
Work out the value of g when $x = 10$

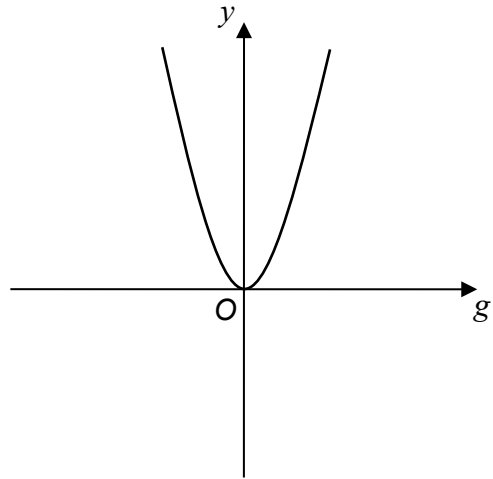**[3 marks]**

Answer _____

16 (c) Which graph shows the relationship between y and g?

Circle the correct letter.

[1 marks]
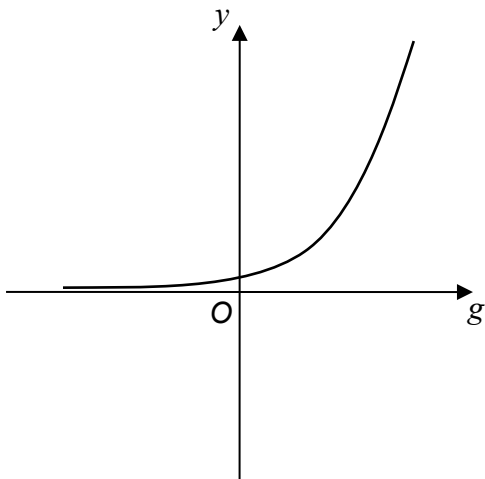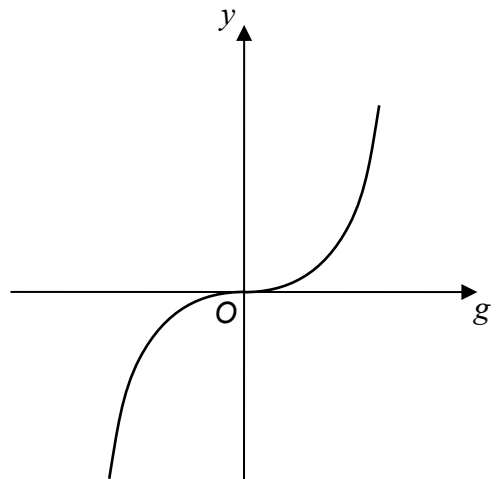
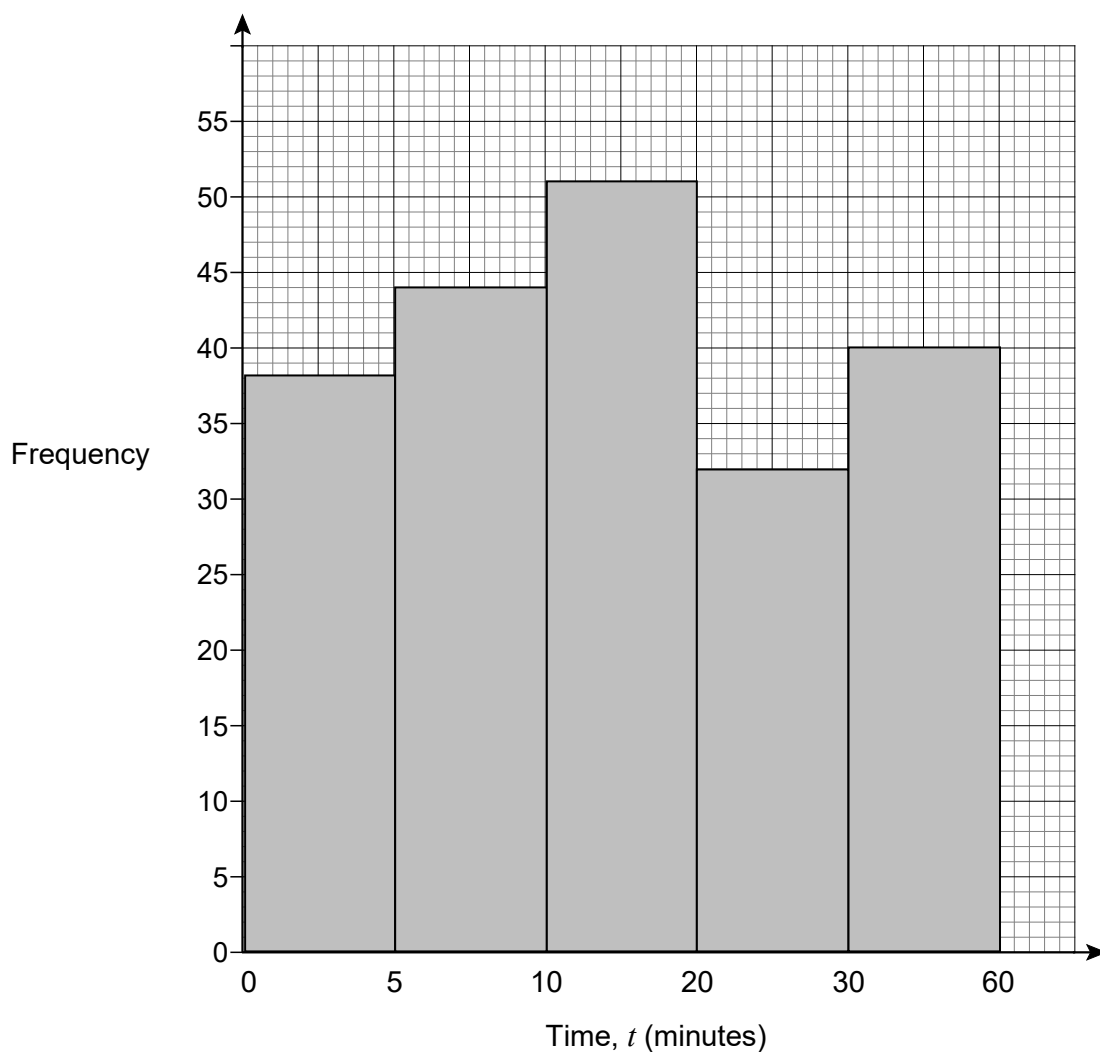A

B

C

D

Turn over ▶

17 Jake asked 205 students how long it took them to travel to school.

The results are shown in the table.

Travelling time, t (minutes)	Number of students
$0 < t \leqslant 5$	38
$5 < t \leqslant 10$	44
$10 < t \leqslant 20$	51
$20 < t \leqslant 30$	32
$30 < t \leqslant 60$	40

This is Joe's attempt to draw a histogram to show the data.
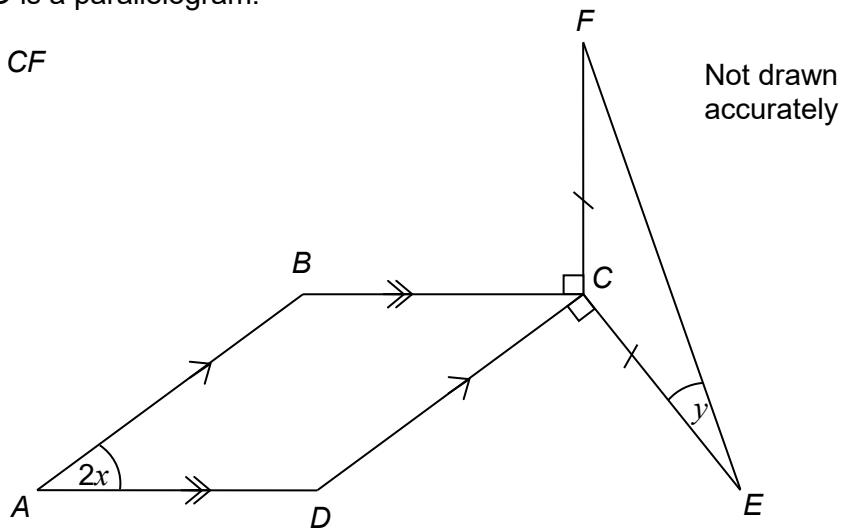
Make **two** criticisms of his histogram.

[2 marks]
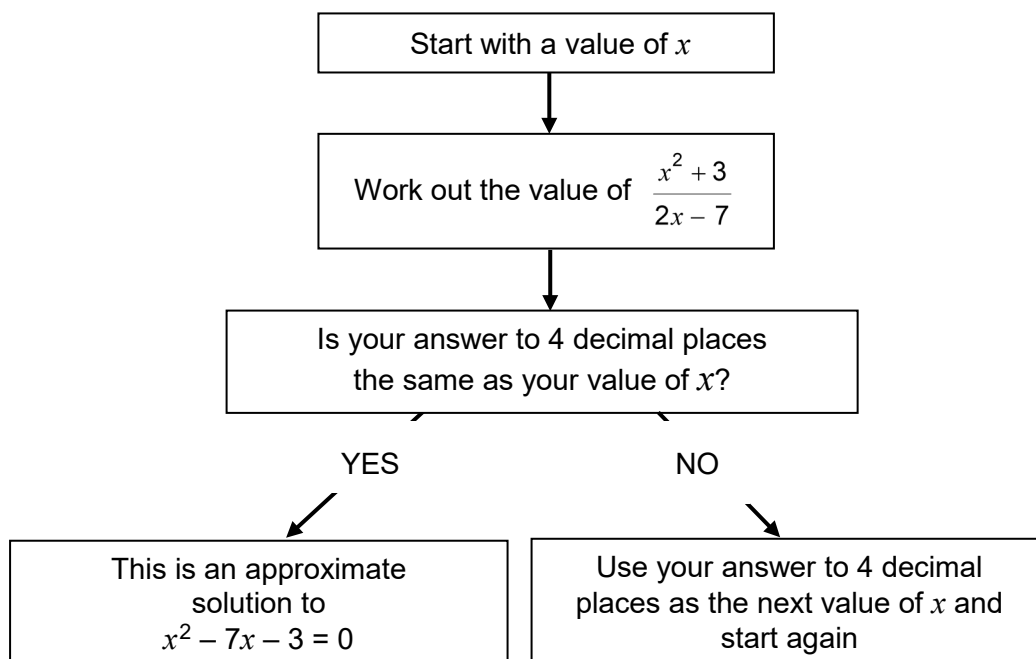
Criticism 1 _____

_____

_____

Criticism 2 _____

_____

_____

18 *ABCD* is a parallelogram.

CE = *CF*

Not drawn accurately

Prove that $y = x$

[5 marks]

_____

_____

_____

_____

_____

_____

_____

7

19 This iterative process can be used to find approximate solutions to $x^2 - 7x - 3 = 0$

Start with a value of x

Work out the value of $\dfrac{x^2 + 3}{2x - 7}$

Is your answer to 4 decimal places the same as your value of x?

YES

NO

This is an approximate solution to $x^2 - 7x - 3 = 0$

Use your answer to 4 decimal places as the next value of x and start again

19 (a) Use this iterative process to find a solution to 4 decimal places of $x^2 - 7x - 3 = 0$

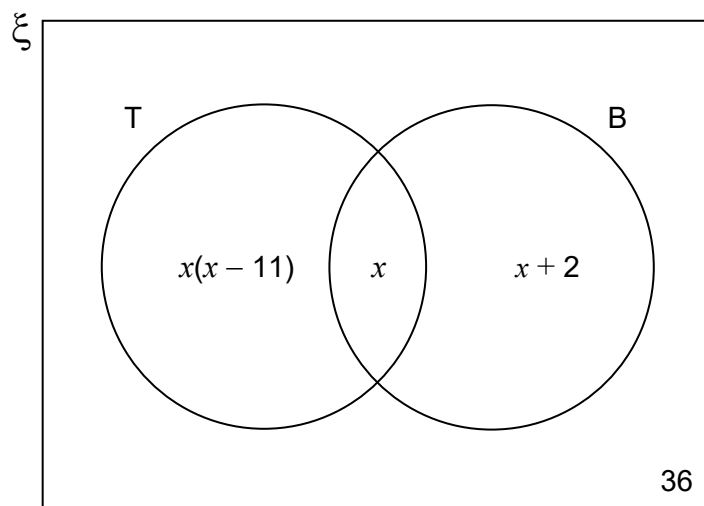Start with the value $x = 7$

[3 marks]

Answer _____

19 (b) By substituting your answer to part **(a)** into $x^2 - 7x - 3$

comment on the accuracy of your solution to $x^2 - 7x - 3 = 0$

[2 marks]

20 The Venn diagram shows information about a coin collection.

ξ = 150 coins in the collection

T = coins from the 20th century
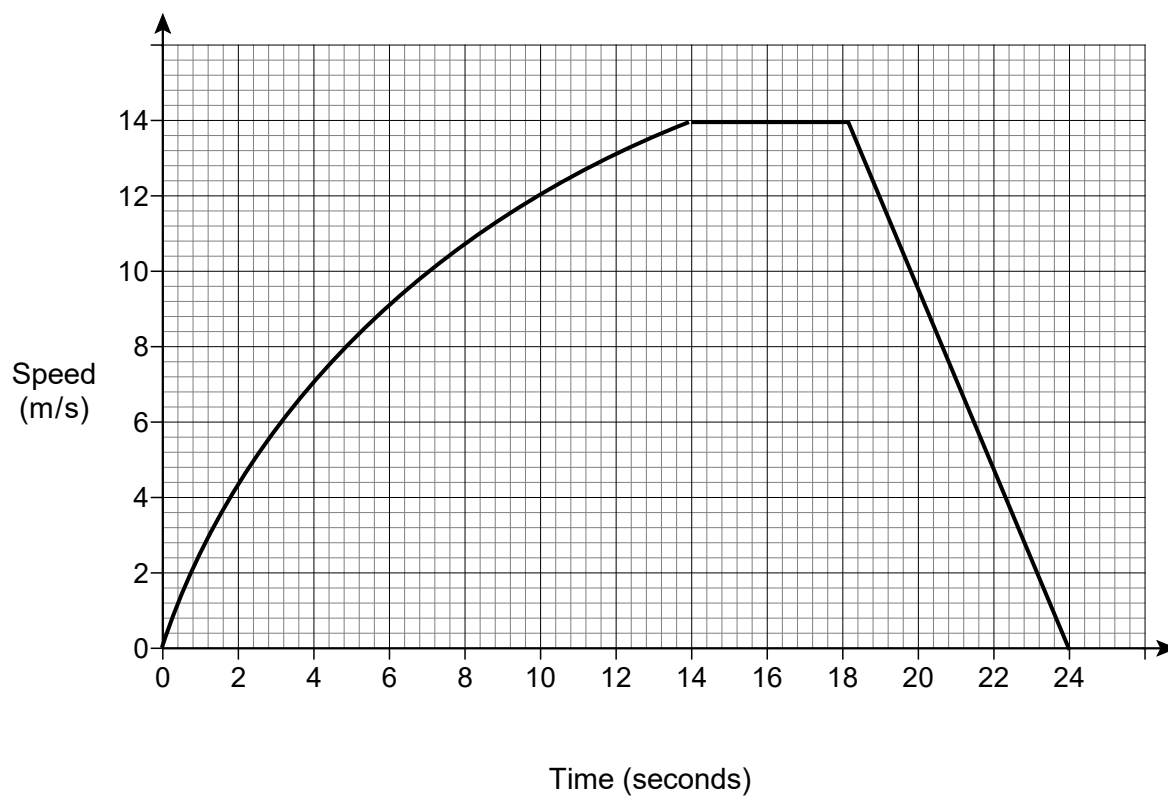
B = British coins

A coin is chosen at random.

It is British.

Work out the probability that it is from the 20th century.

[5 marks]

Answer _____

10

21 The speed-time graph for a car's journey is shown.

Speed (m/s)

Time (seconds)

21 (a) Estimate the acceleration at 4 seconds.

You **must** show your working.

[3 marks]

_____

_____

_____

Answer _____ m/s^2

21 (b) Estimate the average speed of the car for the journey.

You **must** show your working.

[4 marks]

Answer _____ m/s

21 (c) Evaluate your answer to part **(b)**.

Tick a box.

☐ underestimate   ☐ exact   ☐ overestimate

[1 mark]

22 Show that $\dfrac{2w+6}{w^2-16} \times \dfrac{w+4}{w^2+4w+3} \times (3w^2-13w+4)$

simplifies to $\dfrac{aw+b}{cw+d}$ where a, b, c and d are integers

[5 marks]

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

END OF QUESTIONS

5