

GCSE Mathematics Specification (8300/2H)

H

Paper 2 Higher tier

Date

Morning

1 hour 30 minutes

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 bottom 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 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.

Please write clearly, in block capitals, to allow character computer recognition.

Centre number

Candidate number

Surname

Forename(s)

Candidate signature _____

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

1 Which of these is used to work out density?

Tick a box.

[1 mark]

mass \times volume

mass² \times volume

mass \div volume

volume \div mass

2 Circle the fraction equivalent to 2.375

[1 mark]

$$\frac{23}{75}$$

$$\frac{9}{4}$$

$$\frac{19}{8}$$

$$\frac{75}{23}$$

3 Circle the equation of the x -axis.

[1 mark]

$x + y = 0$

$x - y = 0$

$x = 0$

$y = 0$

4 The angles of a quadrilateral are 140° , 80° , 60° and 80°

What type of quadrilateral could it be?

Circle your answer.

[1 mark]

Kite

Parallelogram

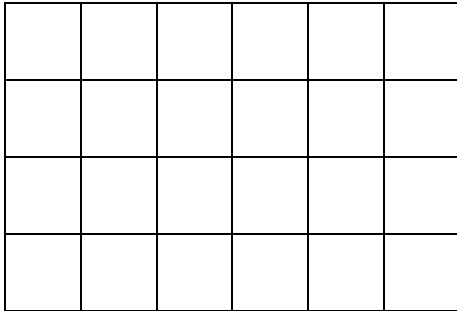
Rhombus

Trapezium

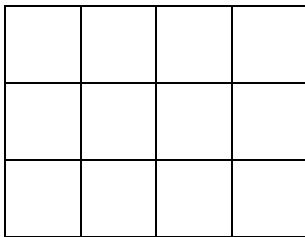
Turn over for the next question

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

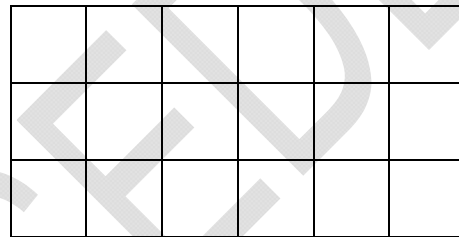
The plan view, front elevation and side elevation are shown.



Plan view



Front elevation



Side elevation

How many centimetre cubes were used to make the cuboid?

[2 marks]

Answer _____

- 6 The times that 80 customers waited at a supermarket checkout are shown.

Time, t (minutes)	Frequency
$0 \leq t < 2$	32
$2 \leq t < 4$	19
$4 \leq t < 6$	20
$6 \leq t < 8$	7
$8 \leq t < 10$	2

- 6 (a) In which class interval is the median?

Circle your answer.

[1 mark]

$0 \leq t < 2$

$2 \leq t < 4$

$4 \leq t < 6$

$6 \leq t < 8$

- 6 (b) The manager of the supermarket says,

“90% of our customers wait less than 6 minutes.”

Does the data support this statement?

You **must** show your working.

[2 marks]

Answer _____

- 7 50 people took a test.
Before the test, they predicted whether they would pass or fail.

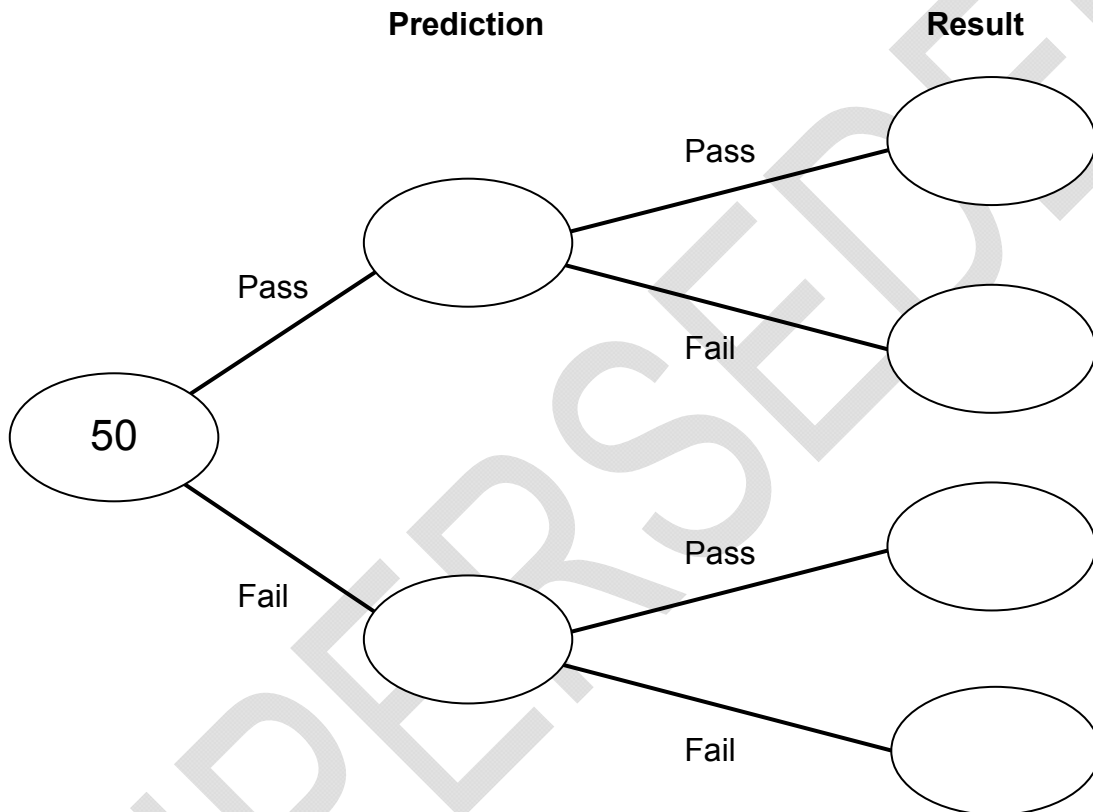
30 people predicted they would pass.

36 people did pass.

Of these 36 people, three times as many predicted pass as predicted fail.

Complete the frequency tree.

[3 marks]



9 Write 280 as a product of its prime factors.

[2 marks]

Answer _____

SUPERSEDED

10 Expand and simplify $(y + 5)(y - 4)$

[2 marks]

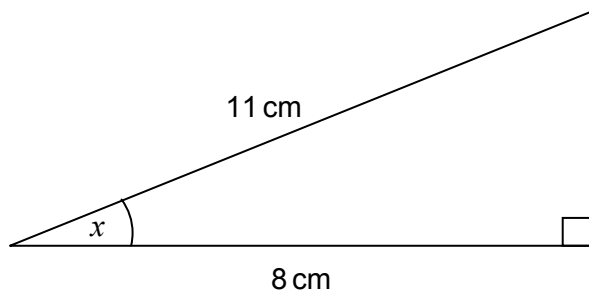
Answer _____

Turn over for the next question

SUPERSEDED

- 11 (a) Work out the size of angle x .

Not drawn accurately

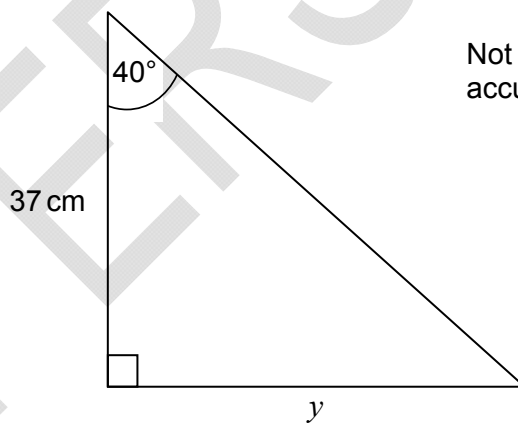


[2 marks]

Answer _____ degrees

- 11 (b) Work out length y .

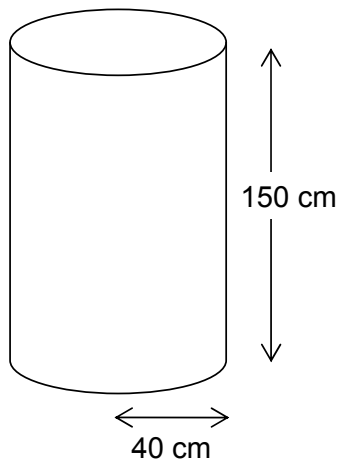
Not drawn accurately



[2 marks]

Answer _____ cm

- 12 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 _____

15 $(6 \times 10^a) + (6 \times 10^b) + (6 \times 10^c) = 6006.6$

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

[3 marks]

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

16 Work out the equation of the line that

is parallel to the line $y = 5x - 3$

passes through $(-2, -4)$

[3 marks]

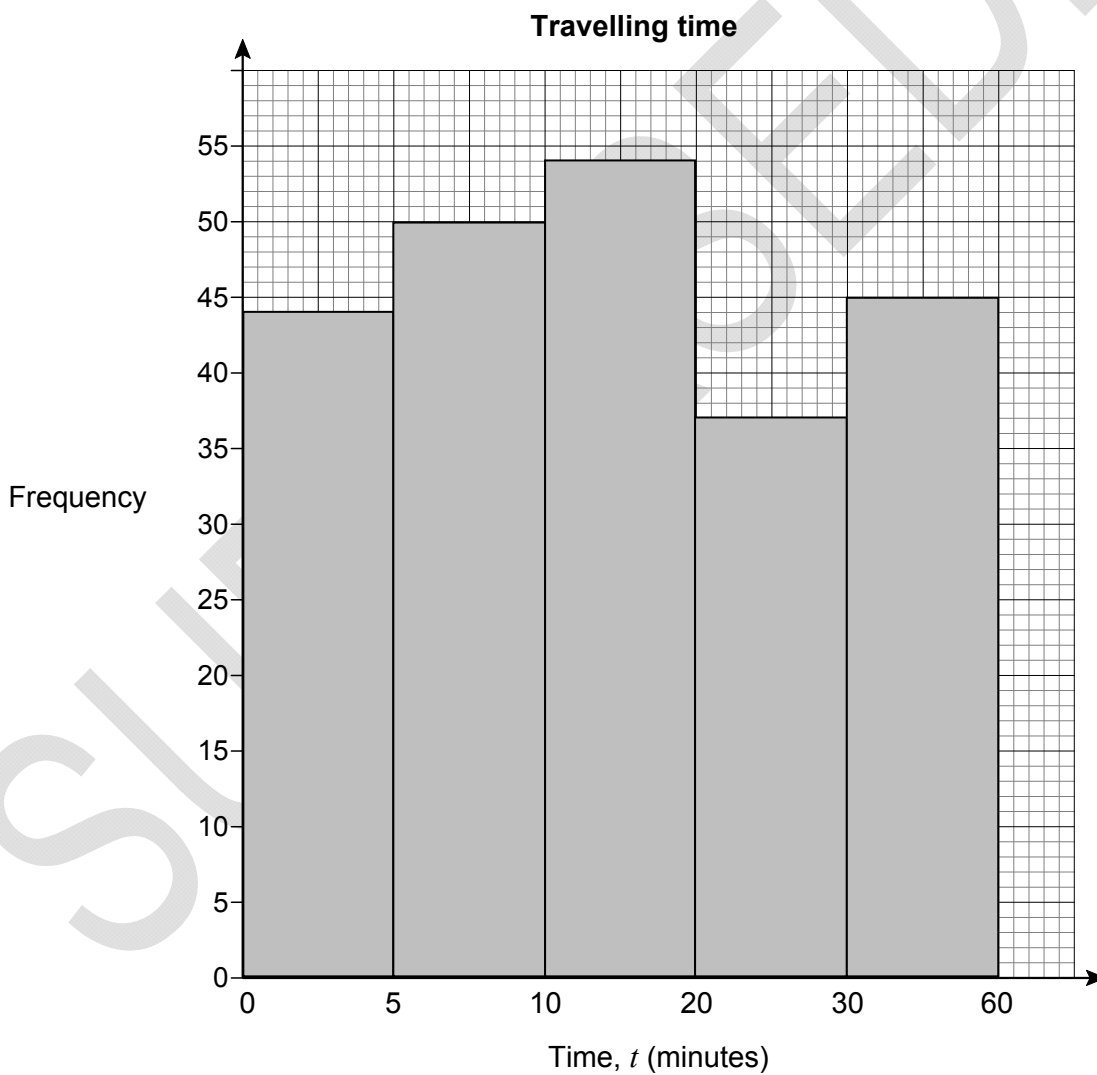
Answer _____

17 Joe asked 230 students how long it took them to travel to school.

The results are shown in the table.

Travelling time, t (minutes)	Number of students
$0 < t \leq 5$	44
$5 < t \leq 10$	50
$10 < t \leq 20$	54
$20 < t \leq 30$	37
$30 < t \leq 60$	45

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 _____

Turn over for the next question

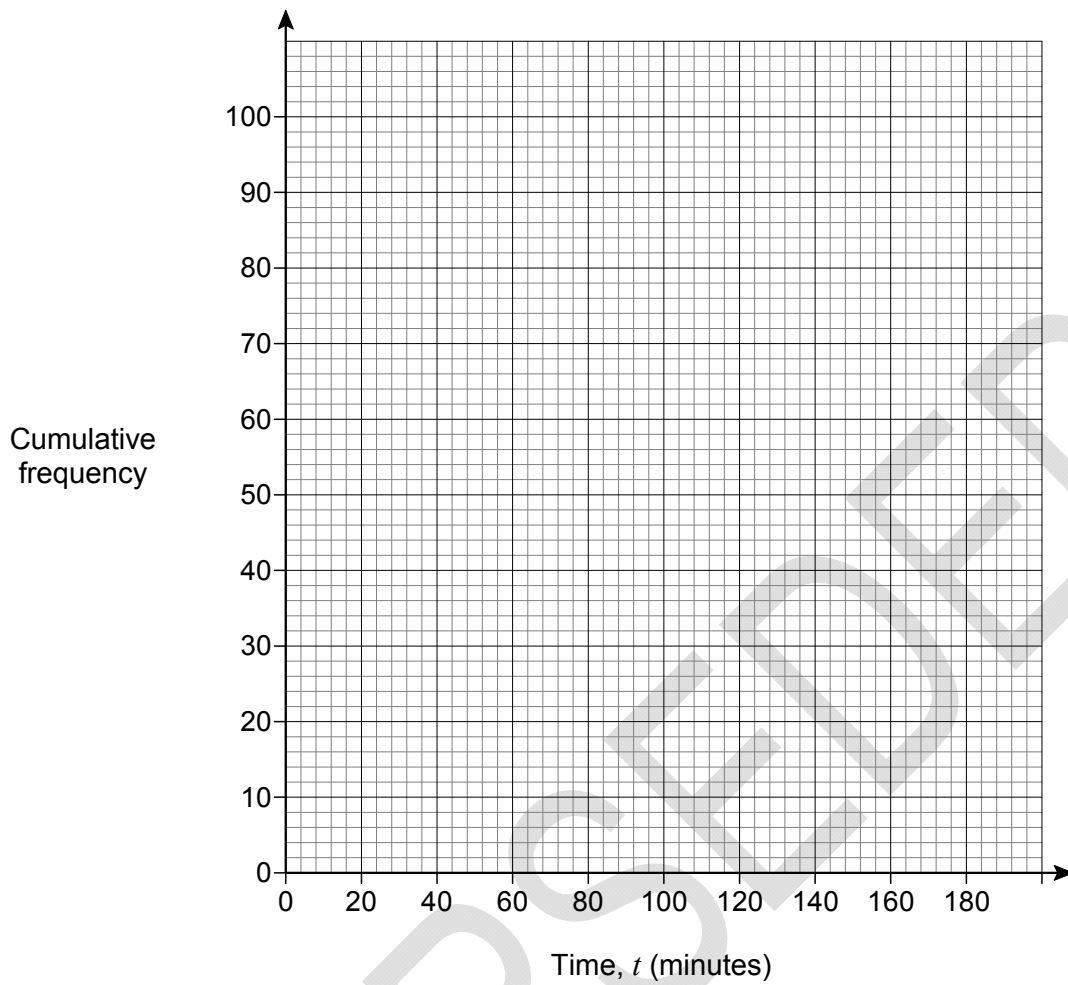
SUPERSEDED

18 The table shows the running times of some films.

18 (a) Draw a cumulative frequency graph on the grid opposite to represent the data.

[3 marks]

Time, t (minutes)	Number of films	
$0 \leq t < 80$	0	
$80 \leq t < 100$	9	
$100 \leq t < 120$	35	
$120 \leq t < 140$	30	
$140 \leq t < 160$	18	
$160 \leq t < 180$	8	



- 18 (b)** Estimate the number of these films with a running time of less than $2\frac{1}{2}$ hours.

[1 mark]

Answer _____

Turn over for the next question

- 19** w is directly proportional to y
 w is inversely proportional to x^2

- 19 (a)** When $y = 4$, $w = 14$

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

[2 marks]

Answer _____

- 19 (b)** When $x = 2$, $w = 5$

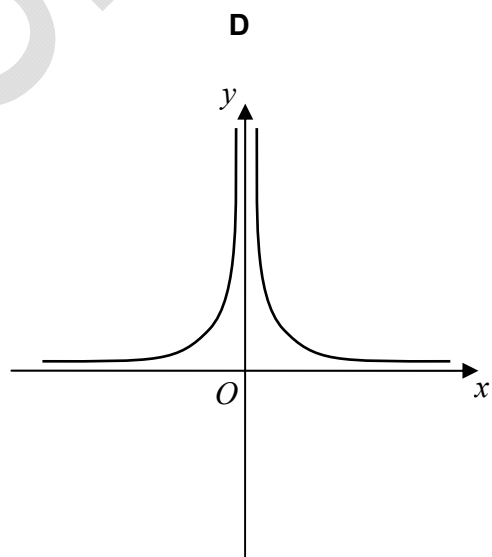
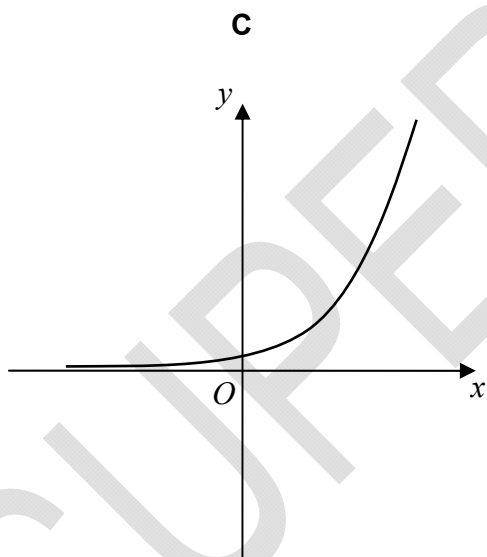
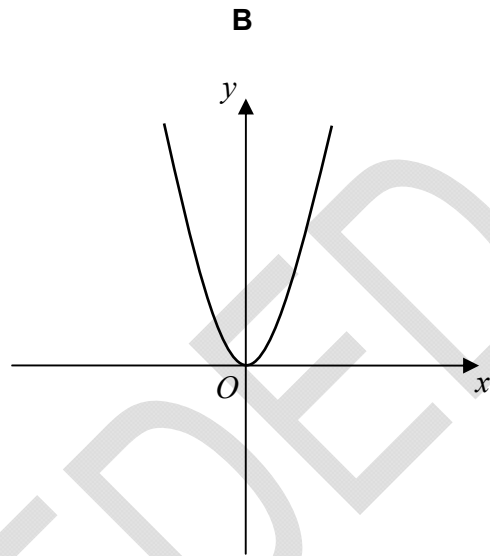
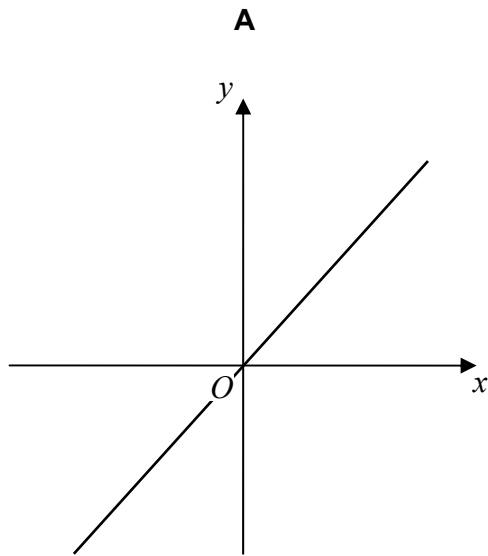
Work out the value of w when $x = 10$

[3 marks]

Answer _____

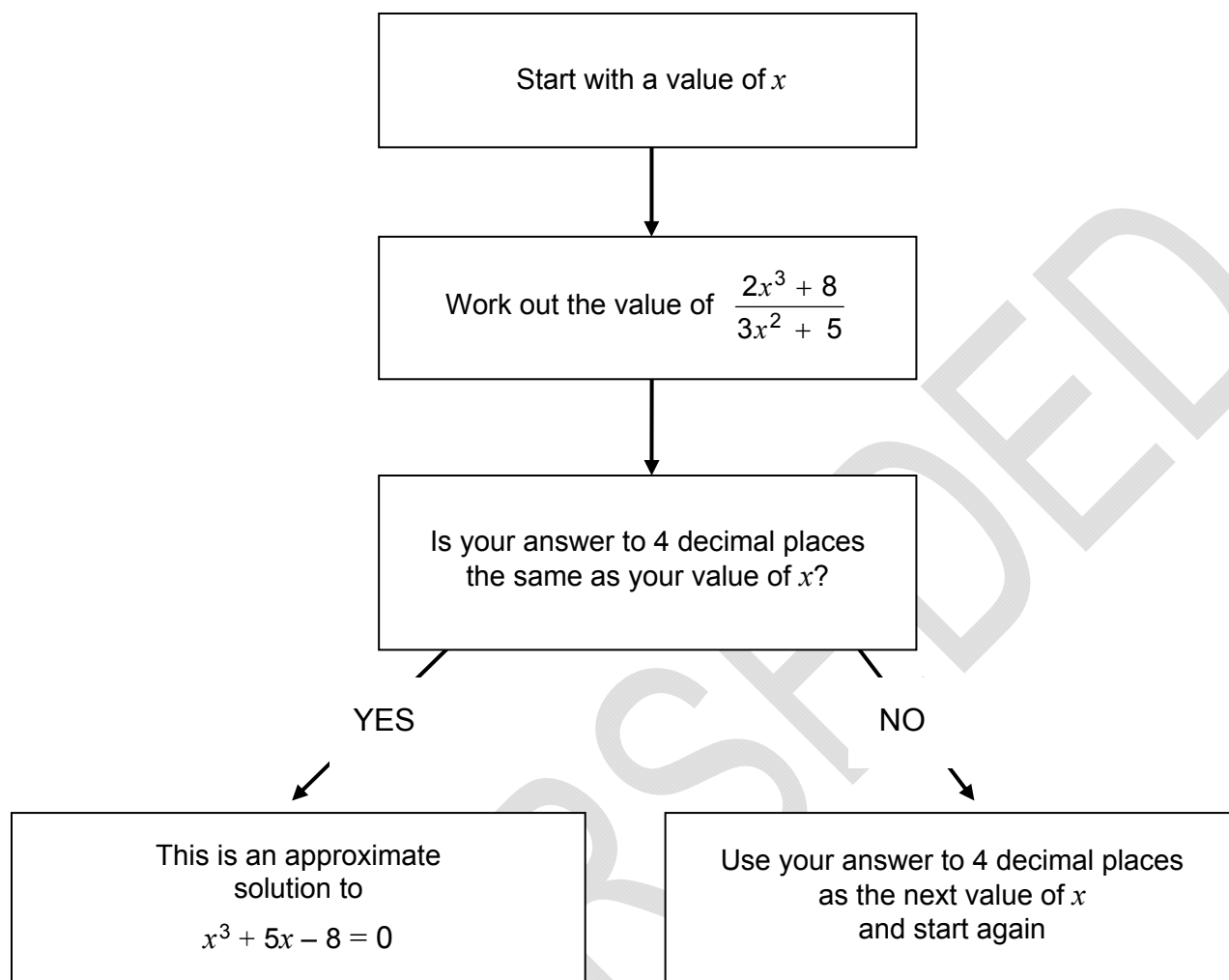
- 19 (c) Which graph shows the relationship between y and x ?
Circle the correct letter.

[1 mark]



20

This iterative process can be used to find approximate solutions to $x^3 + 5x - 8 = 0$



20 (a) Use this iterative process to find a solution to 4 decimal places of $x^3 + 5x - 8 = 0$

Start with the value $x = 1$

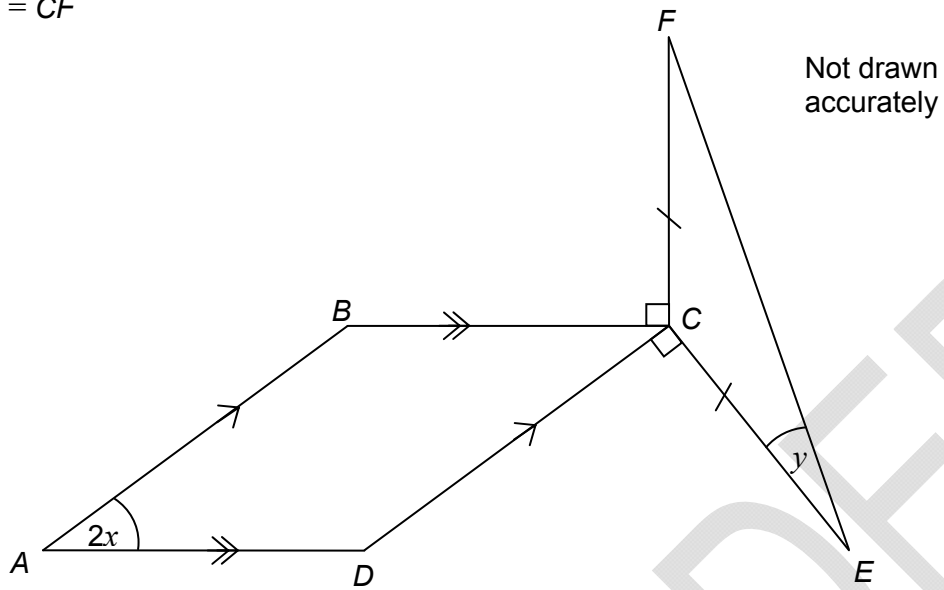
[3 marks]

Answer _____

20 (b) By substituting your answer to part (a) into $x^3 + 5x - 8$
comment on the accuracy of your solution to $x^3 + 5x - 8 = 0$

[2 marks]

21

 $ABCD$ is a parallelogram. $CE = CF$ Prove that $y = x$ **[5 marks]**

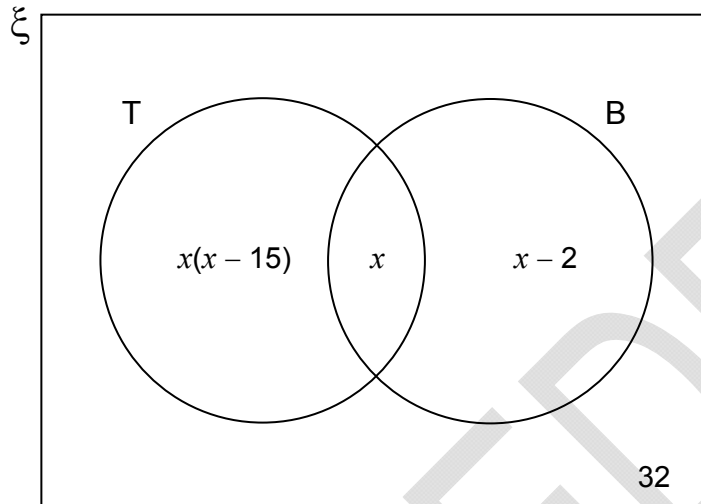
22

The Venn diagram shows information about a coin collection.

ξ = 120 coins in the collection

T = coins from the 20th century

B = British coins



A coin is chosen at random.

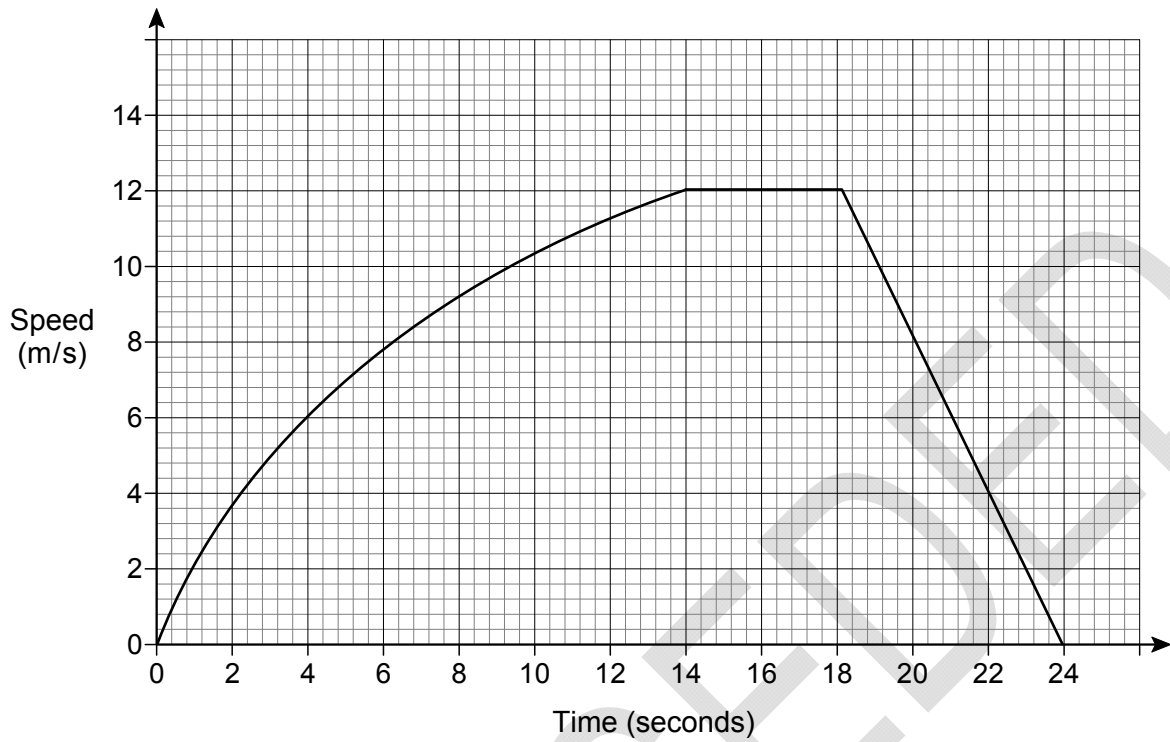
It is British.

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

[5 marks]

Answer _____

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



- 23 (a) Estimate the acceleration at 6 seconds.
You **must** show your working.

[3 marks]

Answer _____ m/s^2

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

You **must** show your working.

[4 marks]

Answer _____ m/s

23 (c) Evaluate your answer to part (b).

Tick a box.

underestimate

exact

overestimate

[1 mark]

Comment _____

24 Show that $\frac{2w+4}{w^2-25} \times \frac{w+5}{w^2+3w+2} \times (3w^2-16w+5)$

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

[5 marks]

END OF QUESTIONS

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SUPERSEDED

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