AQA

NEW PRACTICE PAPER SET 1
Published September 2015

Please write clearly, in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

H

Higher Tier Paper 2

Exam Date Morning Time allowed: 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.
- 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.

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

1 Which of these is used to work out density?

Tick a box.

[1 mark]

mass × volume ☐

mass^2 × volume ☐

mass ÷ volume ☐

volume ÷ 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.

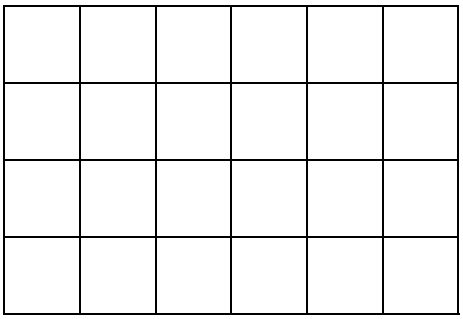
[1 mark]

Kite Parallelogram Rhombus Trapezium

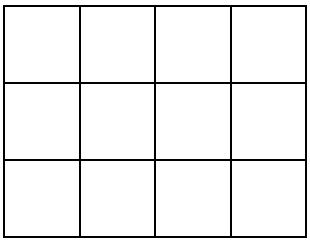
Turn over for the next question

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

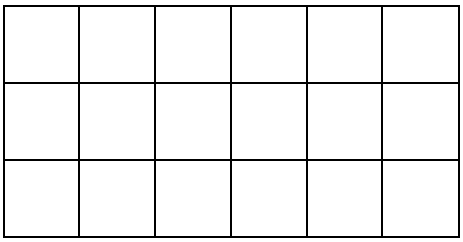
The plan view, front elevation and side elevation are shown.



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
$0 \leqslant t < 2$	32
$2 \leqslant t < 4$	19
$4 \leqslant t < 6$	20
$6 \leqslant t < 8$	7
$8 \leqslant t < 10$	2

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

Circle your answer.

[1 mark]

$0 \leqslant t < 2$ $2 \leqslant t < 4$ $4 \leqslant t < 6$ $6 \leqslant t < 8$

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.

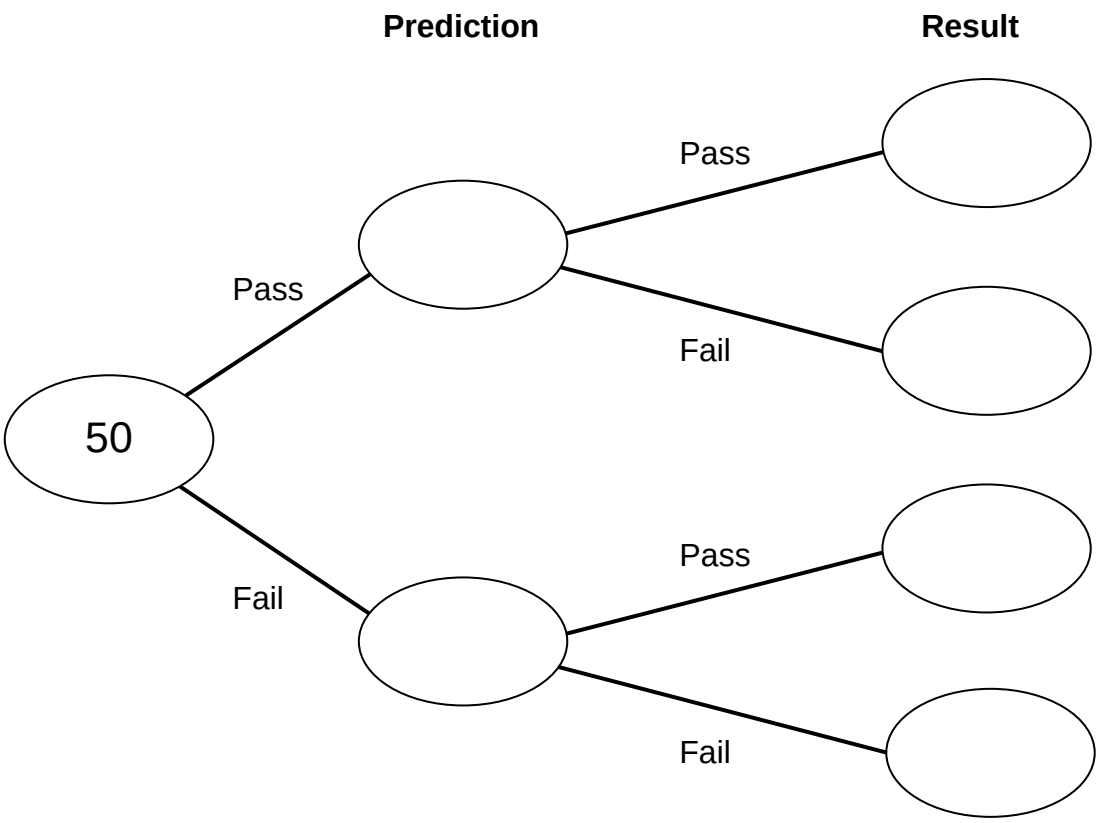
30 people predicted they would pass.

36 people did pass.

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

Complete the frequency tree.

[3 marks]



8 Tomas ran a Lucky Dip stall.

There were 750 tickets, numbered 1 to 750

Tomas sold **all** the winning tickets, and **some** of the losing tickets.

He made a profit of £163

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

[6 marks]

Answer _____

9 Write 280 as a product of its prime factors.

[2 marks]

Answer _____

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

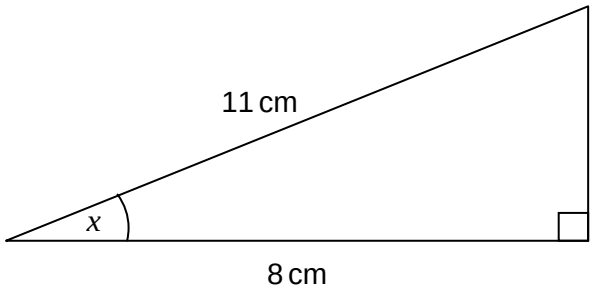
[2 marks]

Answer _____

Turn over for the next question

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

Not drawn accurately

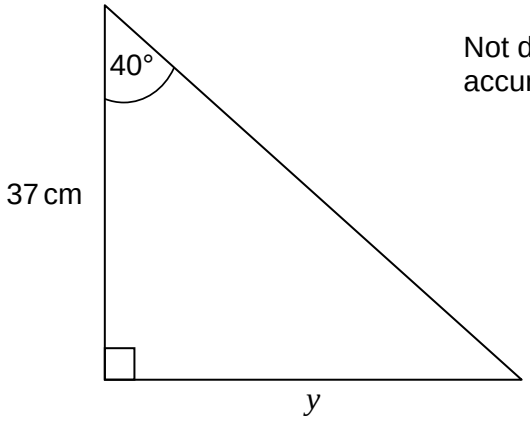


[2 marks]

Answer _____ degrees

11 (b) Work out length y.

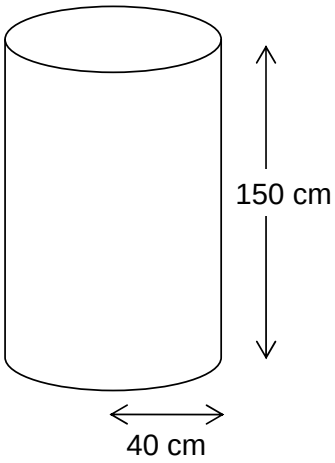
Not drawn accurately



[2 marks]

Answer _____ cm

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



It is filled at the rate of 0.2 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 _____

13 $x(x + 4) \equiv x^2 + 4x$

For how many values of x is $x(x + 4)$ equal to $x^2 + 4x$?

Circle your answer.

[1 mark]

0 1 2 all

14 Sophie sells birthday cards.

She adds 30% profit to the cost price.

She sells the cards for £2.34 each.

She wants to increase her profit to 40% of the cost price.

How much should she sell each card for?

[3 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]

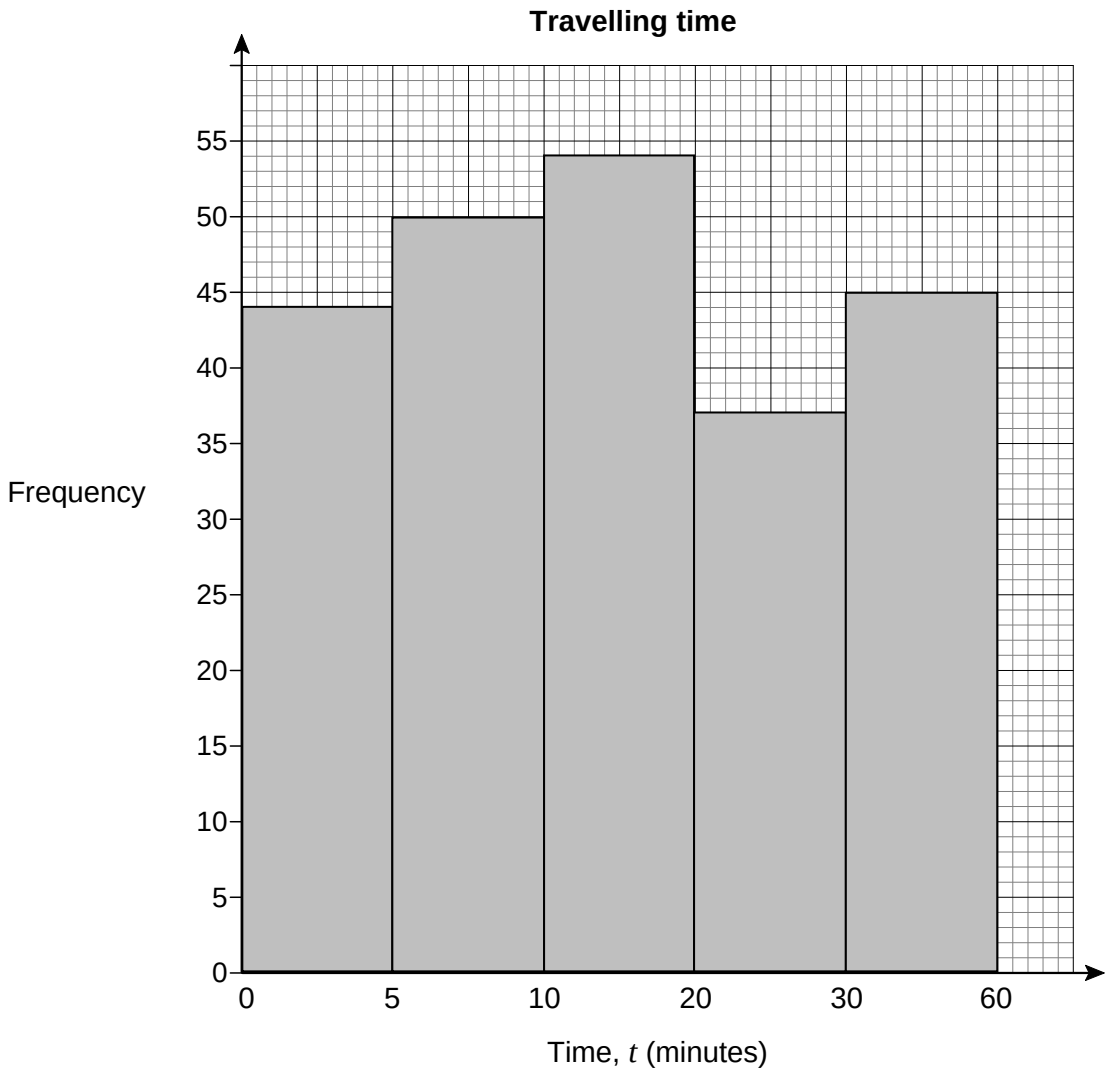
Answer _____

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**
$0 < t \leqslant 5$	44
$5 < t \leqslant 10$	50
$10 < t \leqslant 20$	54
$20 < t \leqslant 30$	37
$30 < t \leqslant 60$	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 _____

_____

_____

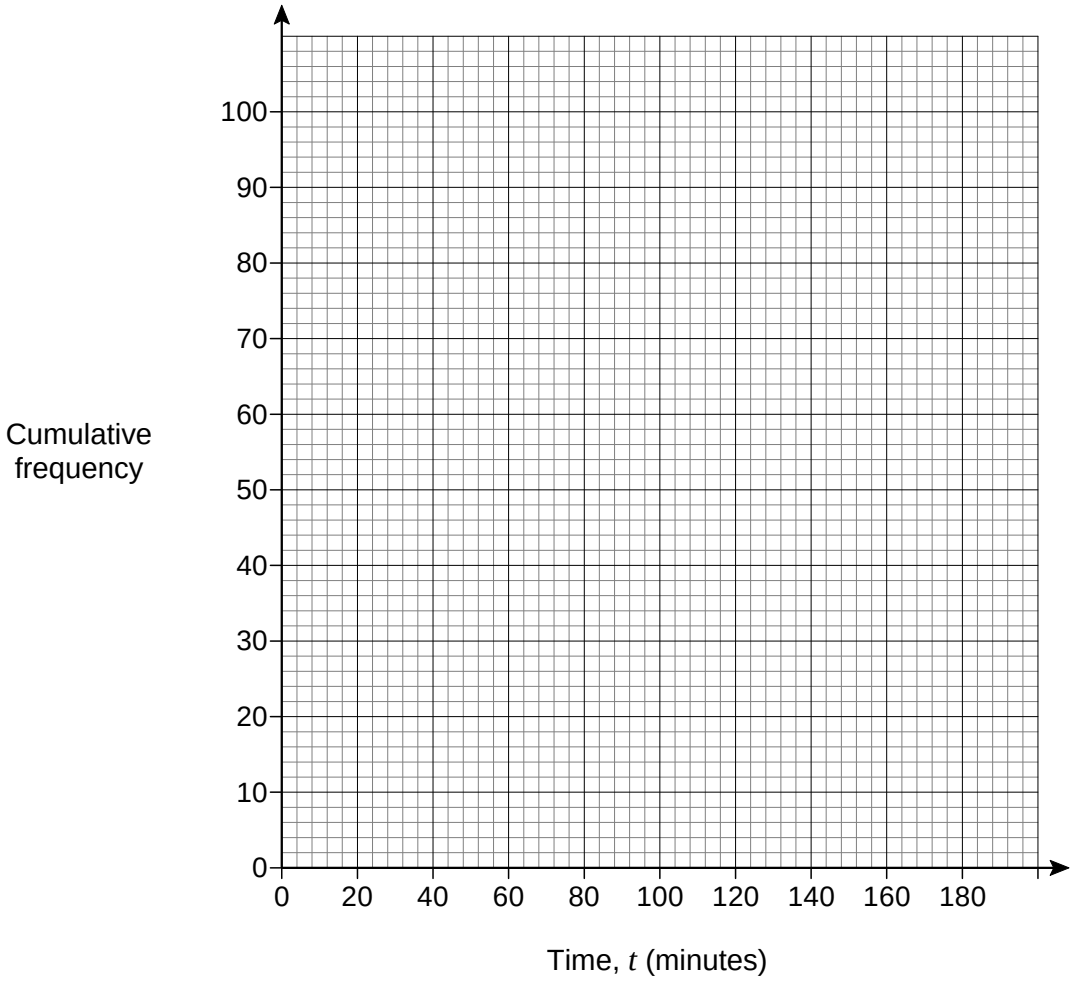
Turn over for the next question

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**
$0 \leqslant t < 80$	0
$80 \leqslant t < 100$	9
$100 \leqslant t < 120$	35
$120 \leqslant t < 140$	30
$140 \leqslant t < 160$	18
$160 \leqslant t < 180$	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]

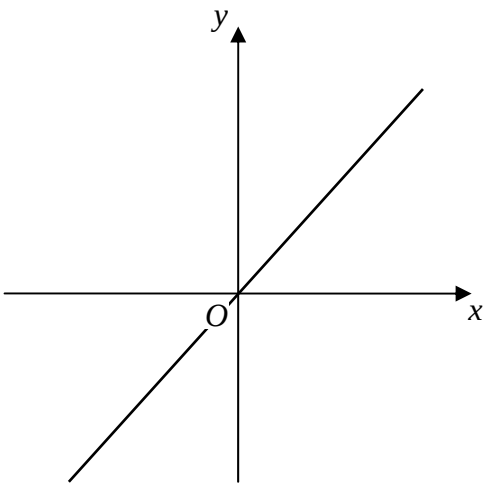
Answer _____

19 (c) Which graph shows the relationship between y and x?

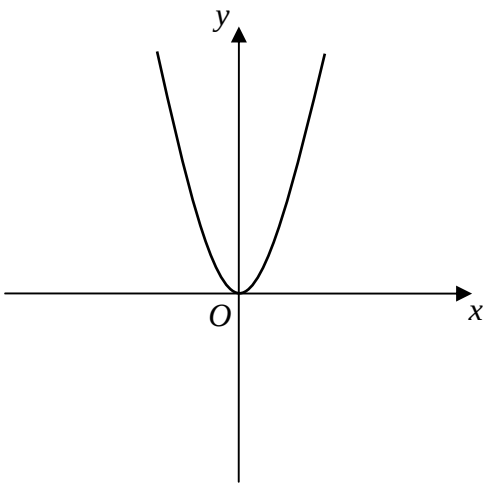
Circle the correct letter.

[1 mark]

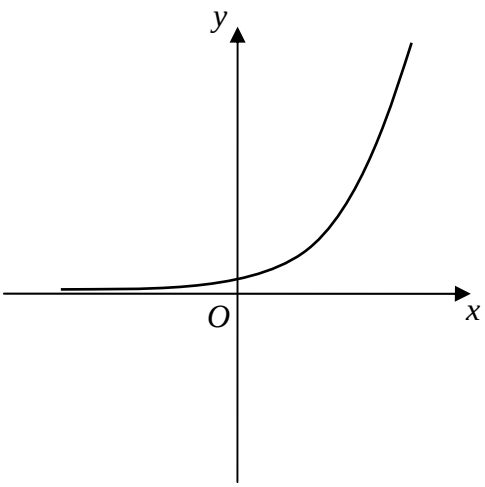
A



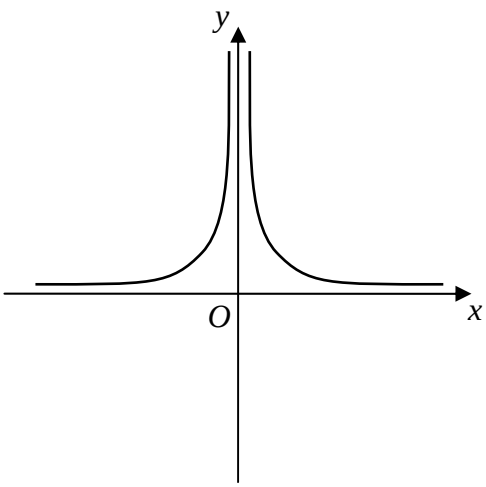
B



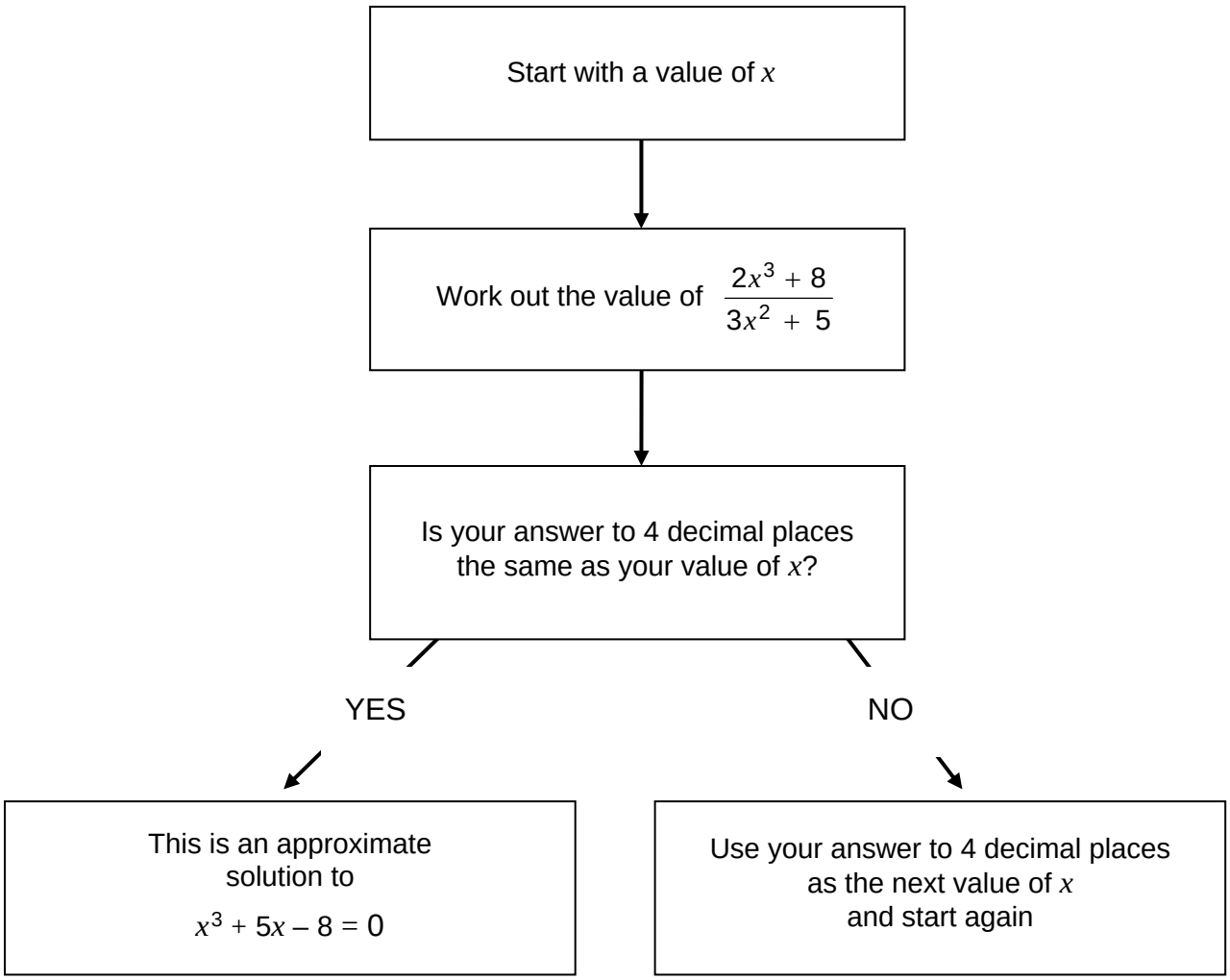
C



D



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]

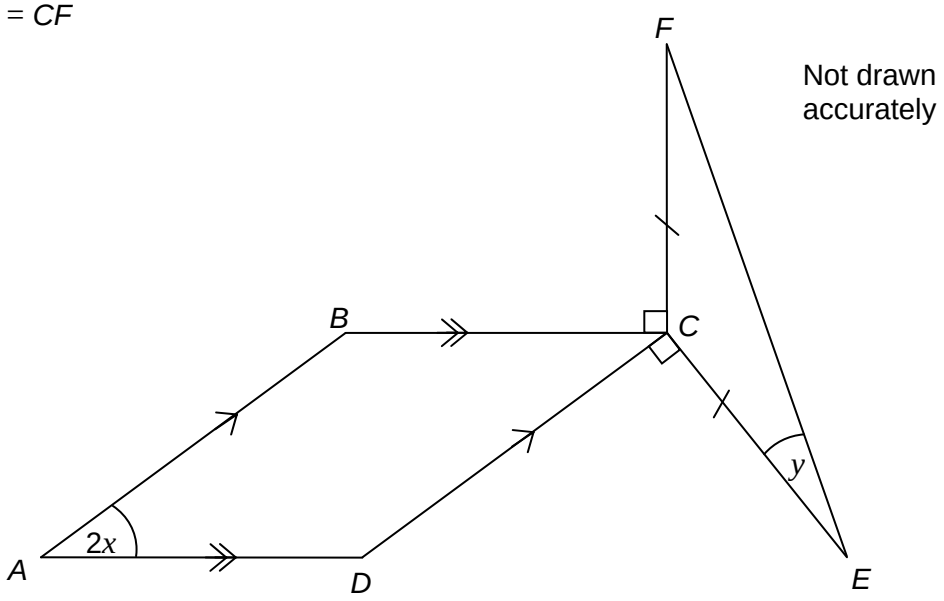
Answer _____

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.

$CE = CF$

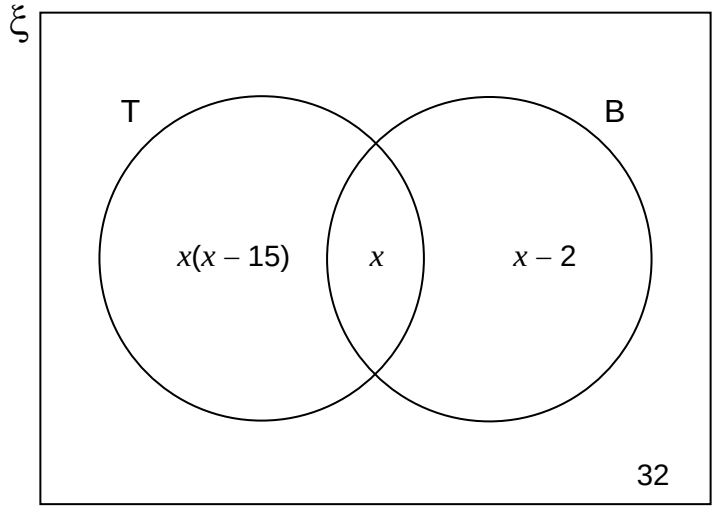


Prove that $y = x$

[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



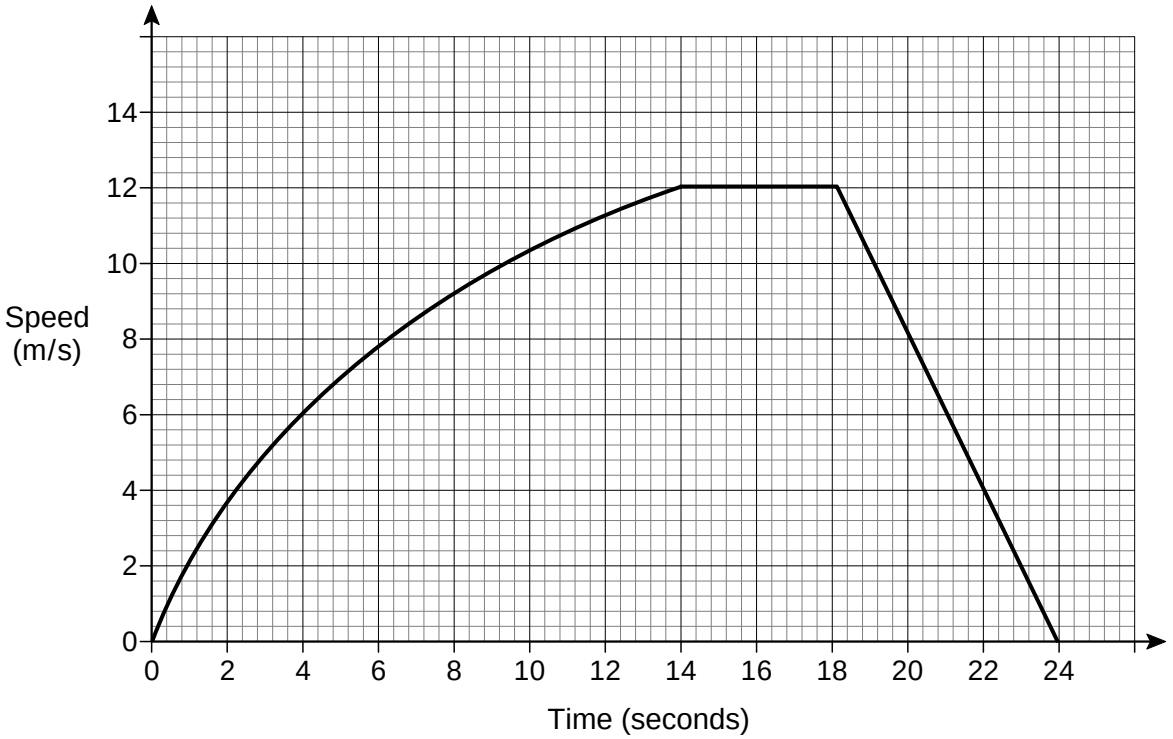
A coin is chosen at random.
It is British.

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