

Please write clearly in block capitals.

Centre number

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Candidate number

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Surname StemUp Model Solution

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE MATHEMATICS

F

Foundation Tier Paper 1 Non-Calculator

Friday 19 May 2023

Morning

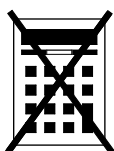
Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:

- mathematical instruments
- the Formulae Sheet (enclosed).

You must **not** use a calculator.



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 spaces provided. Do not write outside the box around each page or on blank pages.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- 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	
20–21	
22	
TOTAL	



J U N 2 3 8 3 0 0 1 F 0 1

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

Do not write
outside the
box

1 Here is a list of numbers.

14 9 20 29 3 45 33

1 (a) Which number in the list is a multiple of 4 ?

[1 mark]

Answer _____ *20*

1 (b) Which number in the list is a square number?

[1 mark]

Answer _____ *9*



- 1 (c) Which **two** numbers in the list have a total of 43 ?

[1 mark]

Answer 14 and 29

- 1 (d) Work out
largest number in the list $\div$ smallest number in the list

[1 mark]

Largest = 45, smallest = 3: $45 \div 3 = 15$

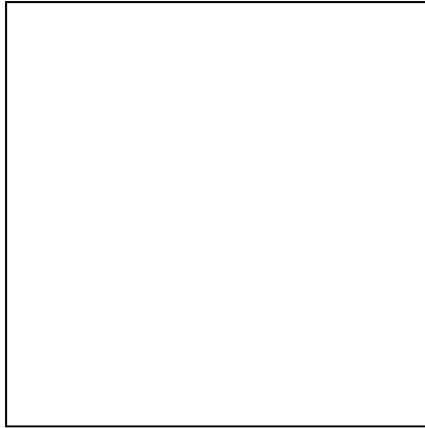
Answer 15

Turn over for the next question

Turn over ►



- 2 (a) Here is a square.



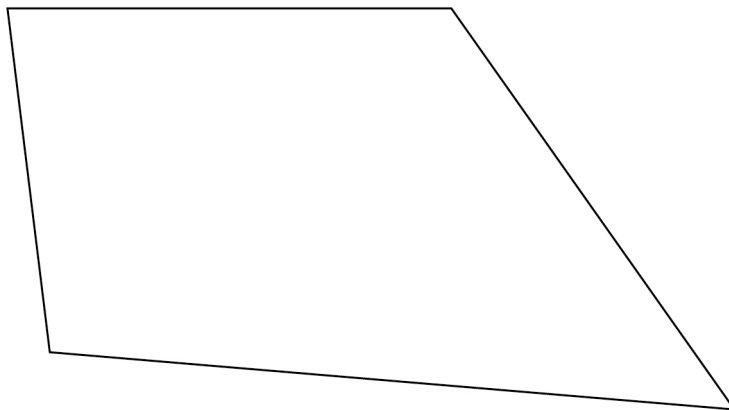
Use a ruler to measure a side length of the square.

Give your answer in **millimetres**.

[1 mark]

Answer 56 mm

- 2 (b) Here is a quadrilateral.



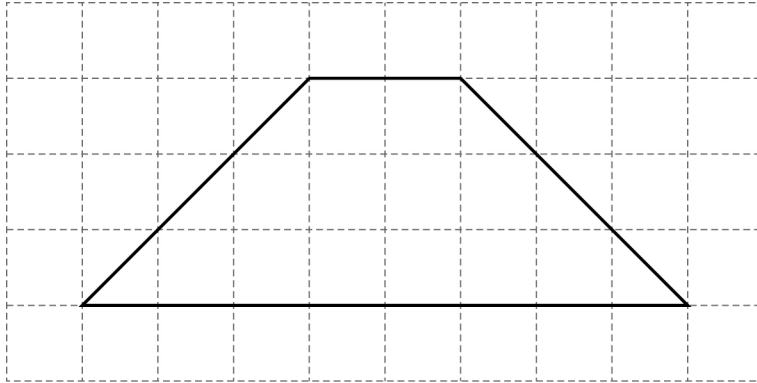
Use a protractor to measure the size of the **smallest** angle.

[1 mark]

Answer 50 °



- 2 (c) A different quadrilateral is drawn on a centimetre grid.



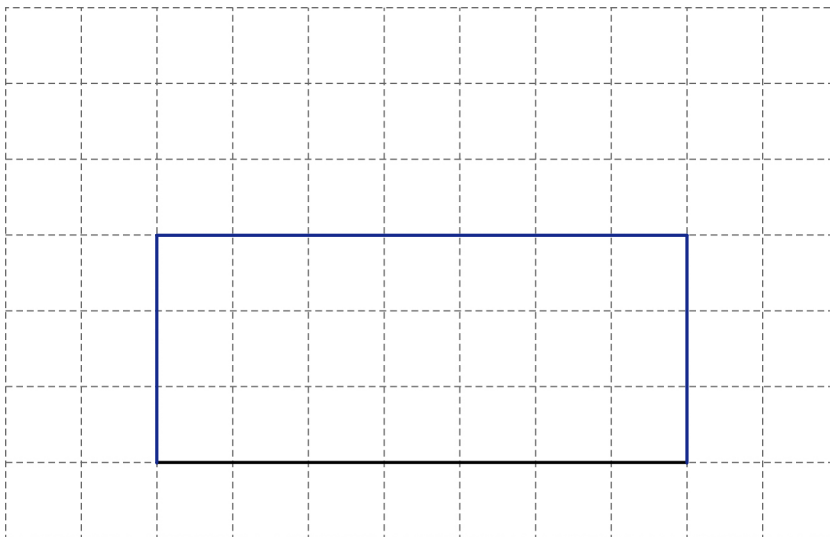
$$12 \text{ full squares} + 6 \text{ half squares} = 12 + 3 = 15$$

By counting squares, work out the **area** of the quadrilateral.

[1 mark]

Answer 15 cm²

- 2 (d) One side of a rectangle is drawn on this centimetre grid.



$$7 + 3 + 7 + 3 = 20 \text{ cm}$$

Complete the rectangle so that it has a **perimeter** of 20 cm

[1 mark]

Turn over ►



3 (a) Work out $(-4) \times (-3)$

[1 mark]

negative $\times$ negative = positive: $(-4) \times (-3) = 12$

Answer 12

3 (b) Work out $6 \times (-5)$

[1 mark]

positive $\times$ negative = negative: $6 \times (-5) = -30$

Answer -30

3 (c) Work out $(-8)^2$

[1 mark]

$(-8)^2 = (-8) \times (-8) = 64$

Answer 64

3 (d) Work out 10^3

[1 mark]

$10^3 = 10 \times 10 \times 10 = 1000$

Answer 1000



- 4 Write 18 out of 30 as a fraction in its simplest form.

[2 marks]

$$\frac{18}{30} = \frac{3}{5} \quad (\text{divide top and bottom by 6})$$

Answer $\frac{3}{5}$

- 5 At a shop

the normal price of one pen is 24p

the normal price of one calculator is £7

The shop has these special offers.

Pens

Half the normal price

Calculators

£1.50 less than the normal price

Work out the **total** price of 5 pens and 1 calculator using the special offers.

[4 marks]

$$\text{Pens offer: } 24 \div 2 = 12\text{p each}$$

$$5 \text{ pens: } 5 \times 12 = 60\text{p} = \text{£}0.60$$

$$\text{Calculator offer: } \text{£}7 - \text{£}1.50 = \text{£}5.50$$

$$\text{Total: } \text{£}5.50 + \text{£}0.60 = \text{£}6.10$$

Answer £ 6.10

Turn over ►



- 6 (a) Write $3\frac{2}{5}$ as an improper fraction.

[1 mark]

$$3 \times 5 + 2 = 17 \text{ fifths}$$

Answer $\frac{17}{5}$

- 6 (b) Write 0.19 as a fraction.

[1 mark]

$$0.19 = 19 \text{ hundredths}$$

Answer $\frac{19}{100}$



7

Misha recorded the main type of weather each day for **55 days**.

The pictogram shows the results for rain, snow and cloud.

Key:  = 4 days

Rain	   
Snow	  
Cloud	    
Sun	 
Fog	 

Sun was recorded on 1 **more** day than fog.

Complete the pictogram for the 55 days.

[4 marks]

$$\text{Rain} = 4 \times 4 = 16, \text{ Snow} = 4 + 4 + 2 = 10, \text{ Cloud} = 4 \times 4 + 2 = 18$$

$$16 + 10 + 18 = 44 \text{ days}$$

$$\text{Sun} + \text{Fog} = 55 - 44 = 11 \text{ days}$$

$$\text{Sun} = 6 \text{ and } \text{Fog} = 5 \quad (6 + 5 = 11 \text{ and } 6 = 5 + 1)$$

$$\text{Sun: } 1 \text{ full} + 1 \text{ half symbol. } \text{Fog: } 1 \text{ full} + 1 \text{ quarter symbol}$$



8

$$T = 5P - W$$

8 (a) Work out the value of T when $P = 4$ and $W = 2$

[2 marks]

$$T = 5 \times 4 - 2$$

$$T = 20 - 2$$

$$T = 18$$

8 (b) Work out the value of P when $T = -40$ and $W = 10$

[3 marks]

$$-40 = 5P - 10$$

$$-40 + 10 = 5P$$

$$5P = -30$$

$$P = -30 \div 5$$

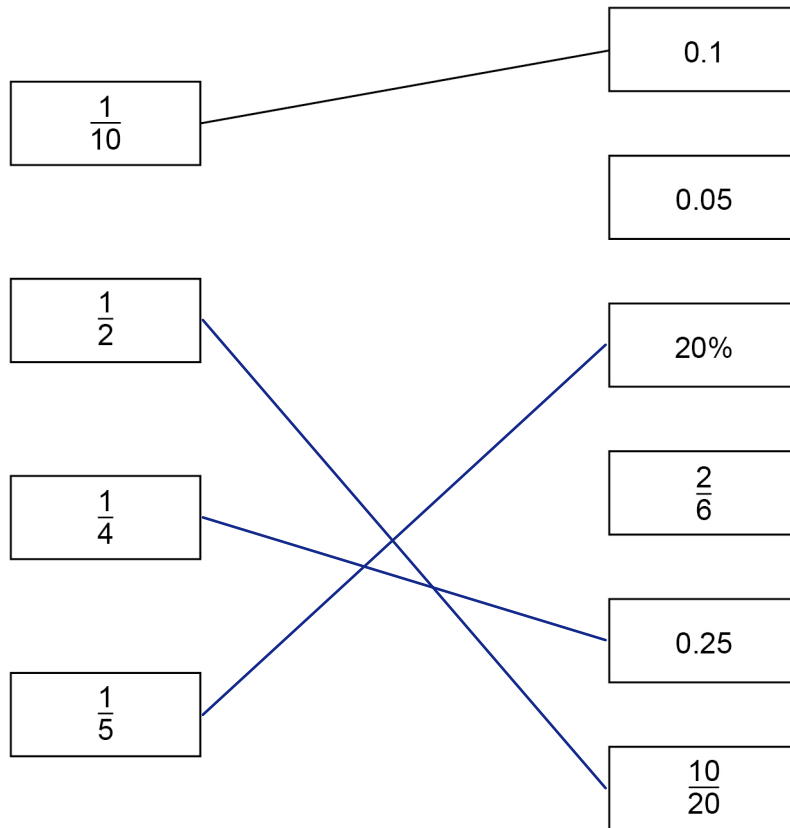
$$P = -6$$



9

Match each box on the left to the box on the right with the same value.
One has been done for you.

[3 marks]



Turn over for the next question

Turn over ►



- 10** Here are two calculations, A and B.

A	$8 \times 3 + 2$
B	$21 - (15 - 4)$

Work out answer to A $\times$ answer to B

[3 marks]

$$A = 8 \times 3 + 2 = 24 + 2 = 26$$

$$B = 21 - (15 - 4) = 21 - 11 = 10$$

$$A \times B = 26 \times 10 = 260$$

Answer 260

- 11** Convert 7 gallons to litres.

Use 1 gallon = 4.5 litres

[2 marks]

$$7 \times 4.5$$

$$7 \times 4 = 28, \quad 7 \times 0.5 = 3.5$$

$$28 + 3.5 = 31.5$$

Answer 31.5 litres



- 12** The table shows monthly payments for electricity.

October	November
£120	£240

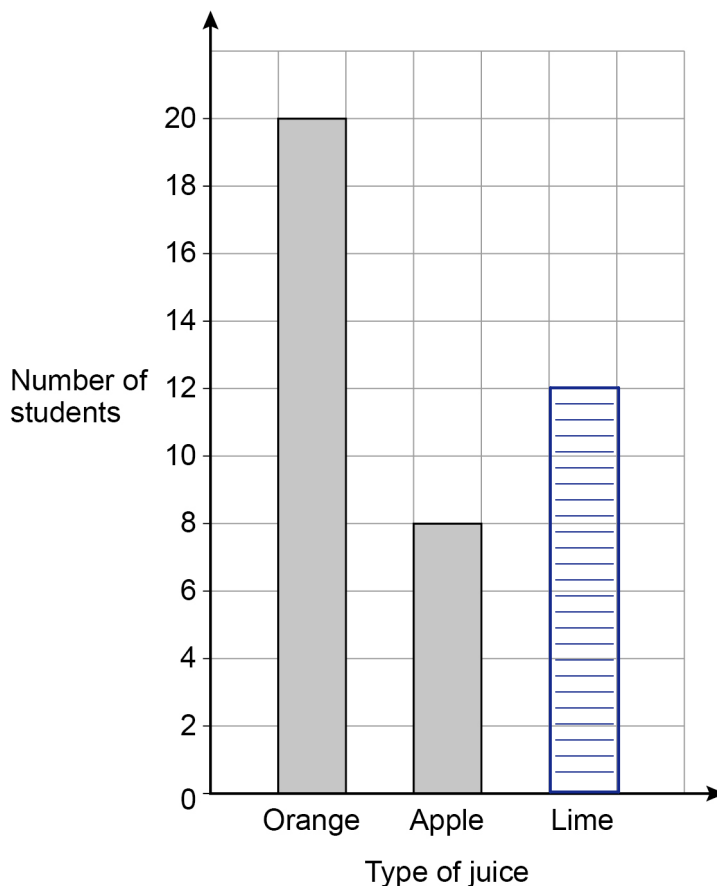
Write down the percentage increase from October to November.

[1 mark]

$$240 - 120 = 120, \text{ an increase of } 120 \text{ on } 120 = 100\%$$

Answer 100 %

- 13** Students choose juice with their school meal in the ratio
orange : apple : lime = 5 : 2 : 3



Complete the bar chart.

[3 marks]

$$\text{Orange: } 5 \text{ parts} = 20, \text{ so } 1 \text{ part} = 20 \div 5 = 4 \quad (\text{Apple } 2 \times 4 = 8)$$

$$\text{Lime: } 3 \text{ parts} = 3 \times 4 = 12$$

Turn over ►



14

Here is some data about people visiting a gym one week.

	Percentage of all visitors	Mean number of hours visiting	Range of number of hours visiting
Members	64	4	6
Guests	36	$2\frac{1}{2}$	8

Compare the data for the members with the data for the guests.

Make **three** comparisons.

[3 marks]

Comparison 1 *There were more members than guests*

(64% of visitors were members, only 36% were guests).

Comparison 2 *On average the members visited for longer than*

the guests (mean 4 hours compared with 2.5 hours).

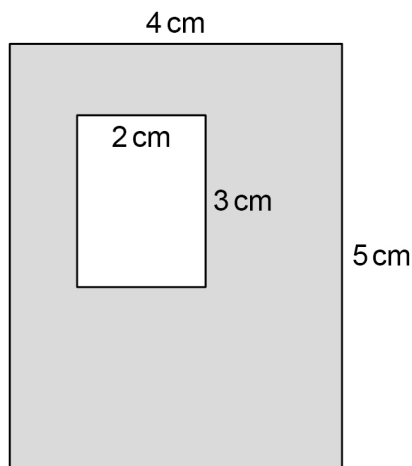
Comparison 3 *The guests' visiting times were more spread out*

(range 8 hours compared with 6 hours), so the

members' times were more consistent.



- 15 A large rectangle has a rectangular hole cut out.



Not drawn
accurately

Work out the percentage of the large rectangle that is shaded.

[3 marks]

$$\text{Large rectangle: } 4 \times 5 = 20 \text{ cm}^2 \quad \text{Hole: } 2 \times 3 = 6 \text{ cm}^2$$

$$\text{Shaded: } 20 - 6 = 14 \text{ cm}^2$$

$$\frac{14}{20} = \frac{70}{100} = 70\%$$

Answer 70 %

- 16 Liz travels 18 miles in 20 minutes.

Work out her average speed in miles per hour.

[3 marks]

$$20 \text{ minutes} \times 3 = 60 \text{ minutes} = 1 \text{ hour}$$

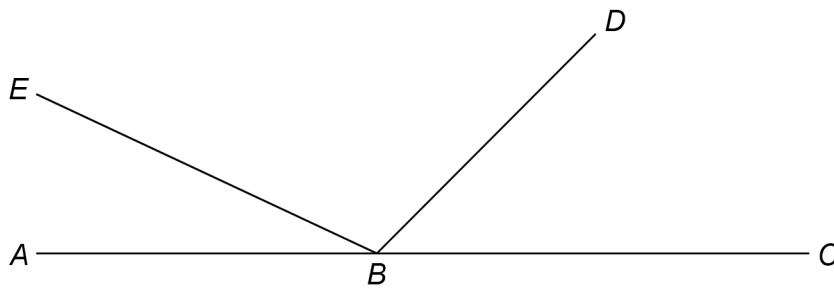
$$18 \text{ miles} \times 3 = 54 \text{ miles in 1 hour}$$

Answer 54 mph

Turn over ►



17

 ABC , BD and BE are straight lines.Not drawn
accuratelyangle $EBD = 5 \times$ angle ABE angle $DBC = 3 \times$ angle ABE Work out the size of angle EBD .**[3 marks]***Let angle $ABE = x$, so $EBD = 5x$ and $DBC = 3x$* *$x + 5x + 3x = 180$ (angles on a straight line add up to 180°)* *$9x = 180$* *$x = 180 \div 9 = 20$* *angle $EBD = 5 \times 20 = 100^\circ$* Answer 100°

18

Two prime numbers are multiplied together.

The answer is an **even** number between 50 and 60

Complete the calculation.

[3 marks]

$$\boxed{2} \times \boxed{29} = \boxed{58}$$

2 is the only even prime, so one of the primes must be 2

$2 \times 29 = 58$, 29 is prime and 58 is even and between 50 and 60

19

Andrew and Bruce share some money in the ratio 5 : 6

Bruce gets £96

Andrew gives $\frac{1}{4}$ of his share to Carl.

Bruce gives $\frac{2}{3}$ of his share to Carl.

How much money does Carl receive?

[4 marks]

Bruce: 6 parts = £96, so 1 part = $96 \div 6 = £16$

Andrew: 5 parts = $5 \times 16 = £80$

Andrew gives $1/4$ of 80 = $80 \div 4 = £20$

Bruce gives $2/3$ of 96 = $96 \div 3 \times 2 = 32 \times 2 = £64$

Carl: $20 + 64 = £84$

Answer £ 84

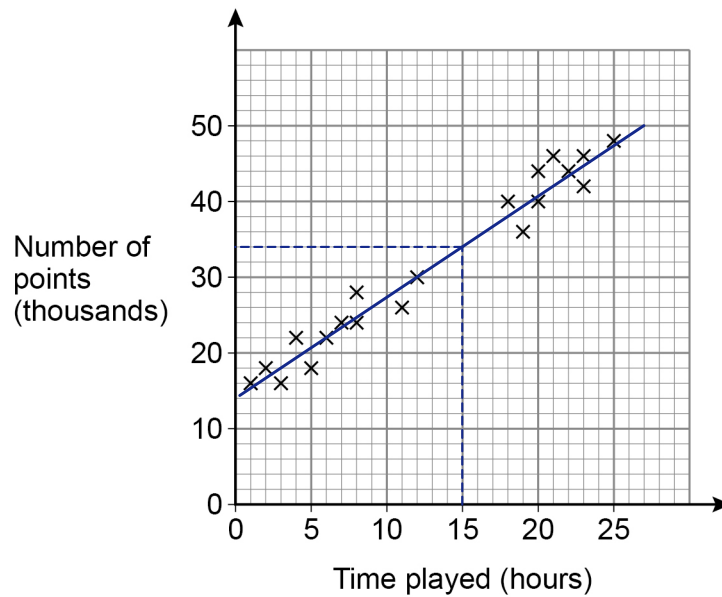
Turn over ►



20

Players score points in a game.

The scatter graph shows the time played and the points scored by some players.



- 20 (a) Circle the strength and type of correlation shown.

[1 mark]

weak positive

strong positive

weak negative

strong negative

- 20 (b) Players get one extra life for every 2000 points they score.

Jonah plays the game for 15 hours.

Use a line of best fit to estimate the number of extra lives he gets.

[3 marks]

From my line of best fit, at 15 hours: 34 thousand = 34 000 points

Extra lives = $34\,000 \div 2000 = 34 \div 2 = 17$

Answer 17



21

$$2^a \times 3 \times 5^2 = 600$$

Work out the value of a .

You **must** show your working.

[3 marks]

$$5^2 = 25, \quad 3 \times 25 = 75$$

$$600 \div 3 = 200, \quad 200 \div 25 = 8$$

$$\text{So } 2^a \times 75 = 600 \text{ means } 2^a = 8$$

$$8 = 2 \times 2 \times 2 = 2^3$$

$$\text{Check: } 8 \times 3 \times 25 = 24 \times 25 = 600$$

$$a = \underline{\quad 3 \quad}$$

22

Expand and simplify fully $5(3x + 4) - 2(x - 1)$

[2 marks]

$$5(3x + 4) = 15x + 20$$

$$-2(x - 1) = -2x + 2$$

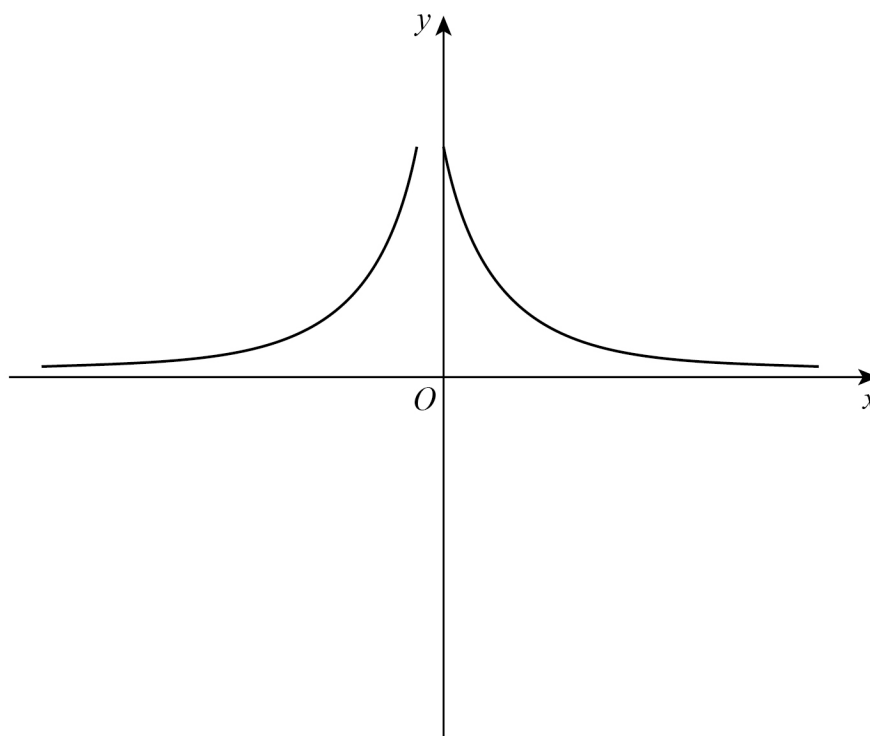
$$15x + 20 - 2x + 2 = 13x + 22$$

$$\text{Answer } \underline{\quad 13x + 22 \quad}$$



23

Erika tries to sketch the graph $y = \frac{1}{x}$ with $x \neq 0$



Make **two** different criticisms of her sketch.

[2 marks]

Criticism 1 The graph touches the y-axis, but x cannot be 0,
so the curve should never meet the y-axis.

Criticism 2 For negative x values y is negative, so the left part
should be below the x-axis (bottom-left), not above it.



24

Sunita is x years old.

Beth is one year younger than Sunita.

Joel is double Sunita's age.

The mean of their ages is 5

How old is **Joel**?**[5 marks]**

$$\text{Sunita} = x, \quad \text{Beth} = x - 1, \quad \text{Joel} = 2x$$

$$\text{Total of ages} = \text{mean} \times 3 = 5 \times 3 = 15$$

$$x + (x - 1) + 2x = 15$$

$$4x - 1 = 15$$

$$4x = 16$$

$$x = 4 \quad (\text{Sunita } 4, \text{ Beth } 3, \text{ Joel } 8: 4 + 3 + 8 = 15)$$

$$\text{Joel} = 2 \times 4 = 8$$

Answer 8

Turn over for the next question

Turn over ►



25

Work out $2\frac{1}{3} \div \frac{4}{5}$

Give your answer as a mixed number.

[4 marks]

$$2\frac{1}{3} = \frac{7}{3} \quad (2 \times 3 + 1 = 7)$$

$$\frac{7}{3} \div \frac{4}{5} = \frac{7}{3} \times \frac{5}{4} = \frac{7 \times 5}{3 \times 4} = \frac{35}{12}$$

$$\frac{35}{12} = 2\frac{11}{12} \quad (35 \div 12 = 2 \text{ remainder } 11)$$

Answer $2\frac{11}{12}$

END OF QUESTIONS

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2 8



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