OCR
Oxford Cambridge and RSA

F

GCSE (9–1) Mathematics

J560/01 Paper 1 (Foundation Tier)

Thursday 2 November 2017 – Morning

Time allowed: 1 hour 30 minutes

6931822683

You may use:
- A scientific or graphical calculator
- Geometrical instruments
- Tracing paper

J560/01

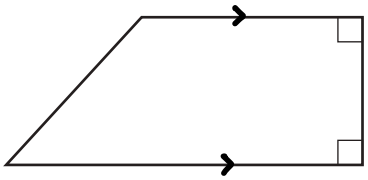
First name									
Last name									
Centre number						Candidate number				

INSTRUCTIONS
- Use black ink. You may use an HB pencil for graphs and diagrams.
- Complete the boxes above with your name, centre number and candidate number.
- Answer **all** the questions.
- Read each question carefully before you start to write your answer.
- Where appropriate, your answers should be supported with working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided.
- Additional paper may be used if required but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the barcodes.

INFORMATION
- The total mark for this paper is **100**.
- The marks for each question are shown in brackets **[ ]**.
- Use the π button on your calculator or take π to be 3.142 unless the question says otherwise.
- This document consists of **16** pages.

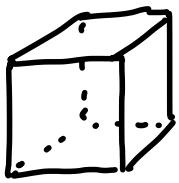
Answer **all** the questions.

1 **(a)** Write down the mathematical name of this shape.



(a) Trapezium **[1]**

(b) How many faces does a cube have?



(b) 6 **[1]**

2 **(a)** Write down

(i) a multiple of 13,

(a)(i) 13 **[1]**

(ii) a prime number between 40 and 50.

41, 43, 47

(ii) 41 **[1]**

(b) Find the lowest common multiple (LCM) of 16 and 28.

16 32 48 64 80 96 112 128

28 56 84 112

(b) 112 **[2]**

3 **(a)** Round 7874 to

(i) the nearest hundred,

7 8 : 7 4

(a)(i) ..... 7900 ..... [1]

(ii) 1 significant figure.

7 : 8 7 4

(ii) ..... 8000 ..... [1]

(b) Find the value of x.

$3^5 \times 3^2 = 3^x$

$= 3^{5+2}$

$= 3^7$

(b) $x =$ ..... 7 ..... [1]

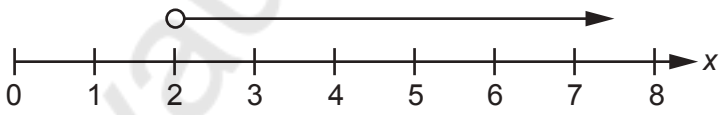
4 **(a)** Use one of these symbols <, > or = to make each statement true.

(i) $\frac{1}{4}$ ..... = ... 0.25 $\frac{1}{4} = 0.25$ [1]

(ii) 0.66 ..... < ..... $\frac{2}{3}$ $\frac{2}{3} = 0.\dot{6}$ [1]

(iii) 6 ..... < ..... 2^3 $2^3 = 2 \times 2 \times 2 = 8$ [1]

(b) Write down the inequality for x that is shown on this number line.



(b) ..... $x > 2$ ..... [1]

5 Write the following in order of size, smallest first.

28% $\frac{7}{26}$ 2.7

÷100

0.28

7 ÷ 26

0.269230 7

(1)

$\frac{7}{26}$ ..... 28% ..... 2.7 ..... [2]

smallest

6 **(a)** Simplify.

(i) $2p + 5p - 3p$

$7p - 3p$

(a)(i) ..... $4p$ ..... **[1]**

(ii) $6j + 3k - j - 5k$

$5j \quad -2k$

(ii) ..... $5j - 2k$ ..... **[2]**

(b) Find the value of $10h + 6t$ when $h = 12$ and $t = 4$.

$10(12) + 6(4)$

$120 + 24$

(b) ..... 144 ..... **[2]**

(c) Rearrange this formula to make d the subject.

$e = f - 7d$

$-f \quad -f$

$e - f = -7d$

$\div -7 \qquad \div -7$

$\frac{e-f}{-7} = d$

(c) ..... $d = \frac{e-f}{-7}$ ..... **[2]**

7 Bill owns four cars. Each car is a different colour.
Each day, he drives to work in one of his cars.
The table shows the probability that Bill chooses a car of a particular colour.

Car	red	blue	yellow	white
Probability	0.4	0.17	0.05	

$= 1$

Work out the probability that Bill chooses the white car.

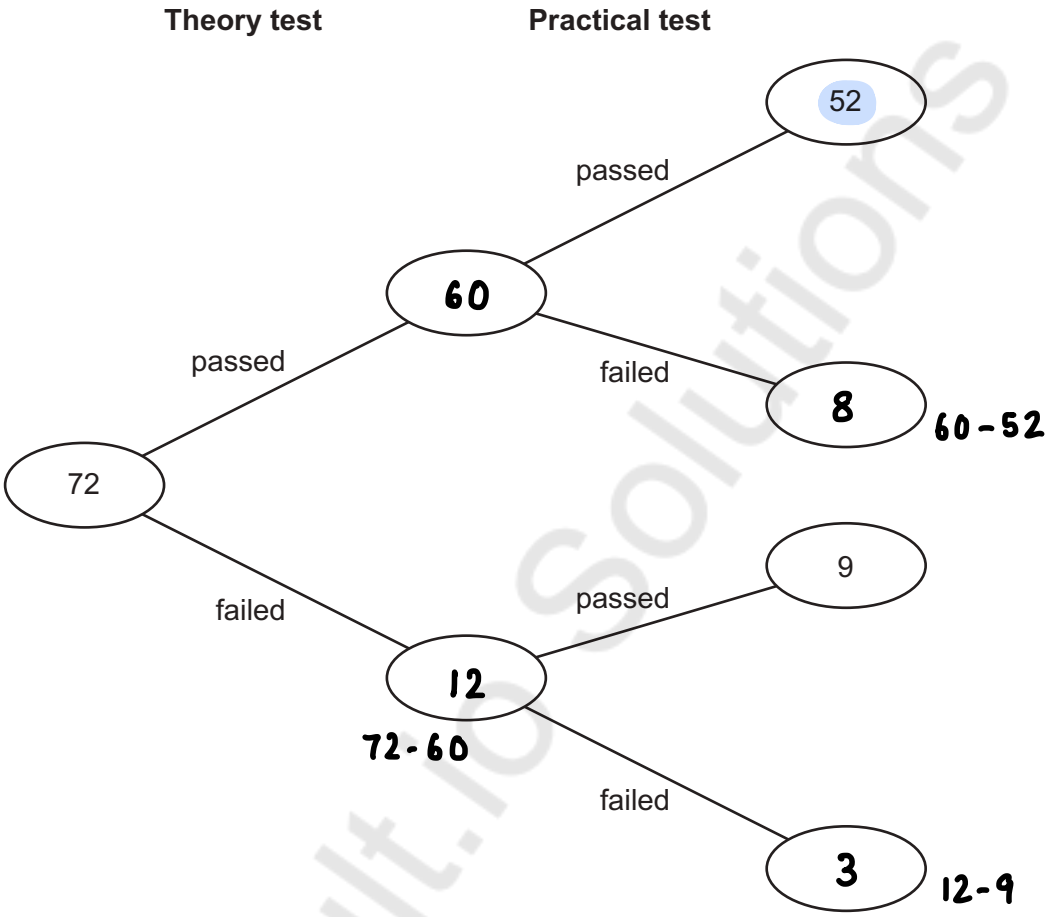
$p(\text{white}) = 1 - 0.4 - 0.17 - 0.05$

$= 0.38$

..... 0.38 ..... **[2]**

8 72 students each took a theory test followed by a practical test.
They either passed or failed each test.

This frequency tree shows some of the results.



(a) How many students passed both tests?

(a) ..... 52 ..... **[1]**

(b) $\frac{5}{6}$ of the 72 students passed the theory test.

Complete the frequency tree. **[4]**

$\frac{5}{6} \times 72 = 60$

Theory = 60

Practical = 52 + 9 = 61

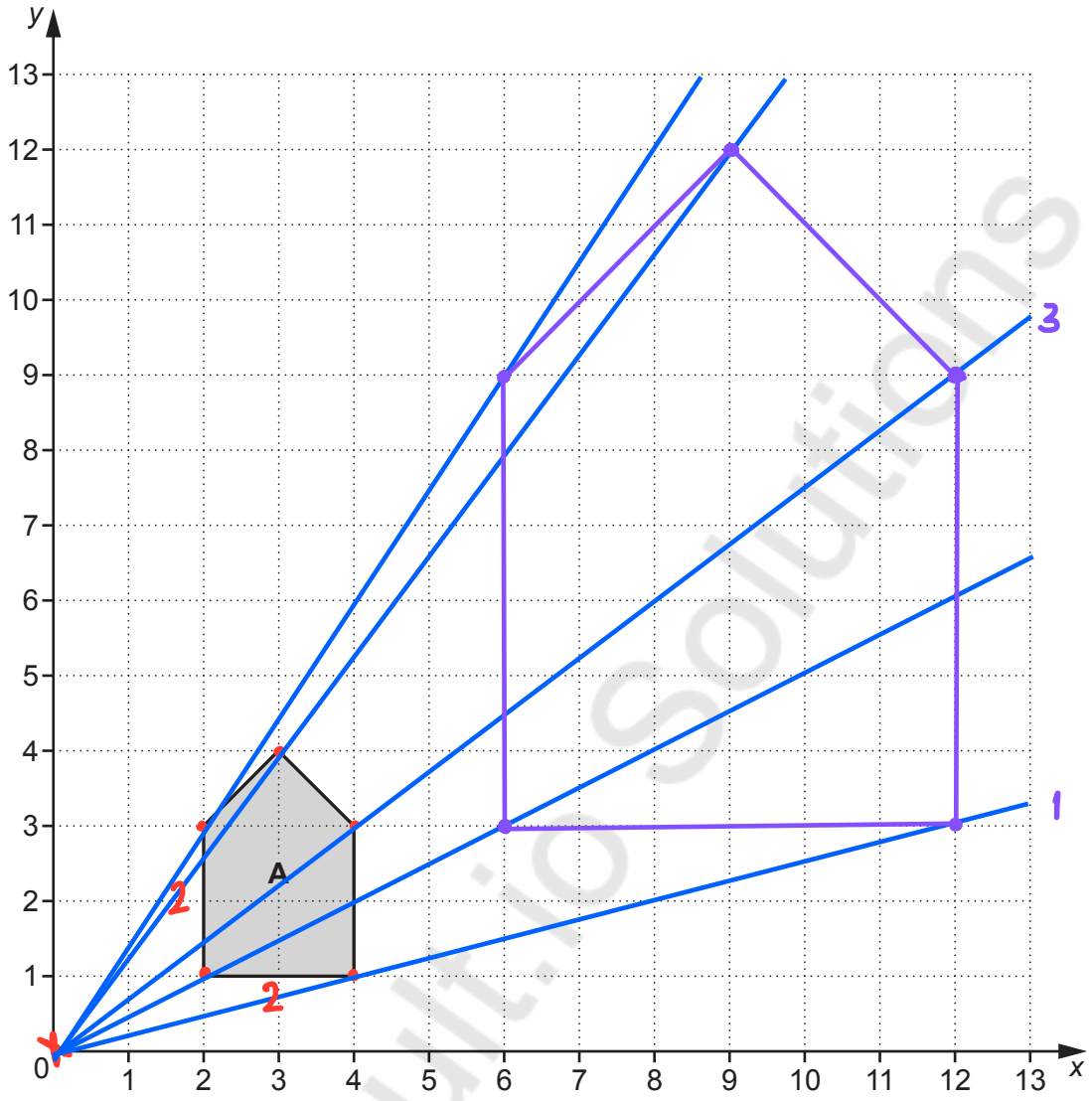
(c) Which test was passed by more students?
Explain your reasoning.

..... Practical test ..... because ..... 61 > 60 .....

.....

..... **[3]**

9 Shape **A** is drawn on the grid below.



Enlarge shape **A** with scale factor 3 and centre of enlargement (0, 0). **[3]**

2 × 3 = 6

10 **(a)** Write 62 as a percentage of 500.

$\frac{62}{500} \times 100 = 12.4$

(a) ..... 12.4 ..... % **[3]**

(b) Increase £196 by 9%.

100% + 9% = 109%

109% $\xrightarrow{\div 100}$ 1.09

1.09 × £196 = £213.64

(b) £ ..... 213.64 ..... **[3]**

11 Students deliver catalogues and leaflets to houses.
One day, they have to deliver 360 catalogues and 1440 leaflets.
Each student can deliver either 15 catalogues **or** 80 leaflets in 1 hour.
Each student can only work for 8 hours.

Work out the **minimum** number of students needed.

Catalogues

8 x 15 = 120 catalogues (1 student)

×3 ×3

360 catalogues (3 students)

Leaflets

8 x 80 = 640 leaflets (1 student)

x 2.5 x2.5

1440 leaflets (2.5 students

~ 3 students)

6 ..... [4]

12 Leo, Kush and Mai share some money in the ratio 3 : 5 : 8.
Kush receives £750 more than Leo.

Calculate the total amount of money that they shared.

L : K : M

3 : 5 : 8

5 - 3 = 2 parts difference

÷2 2 parts = £750 ÷2

1 parts = £375

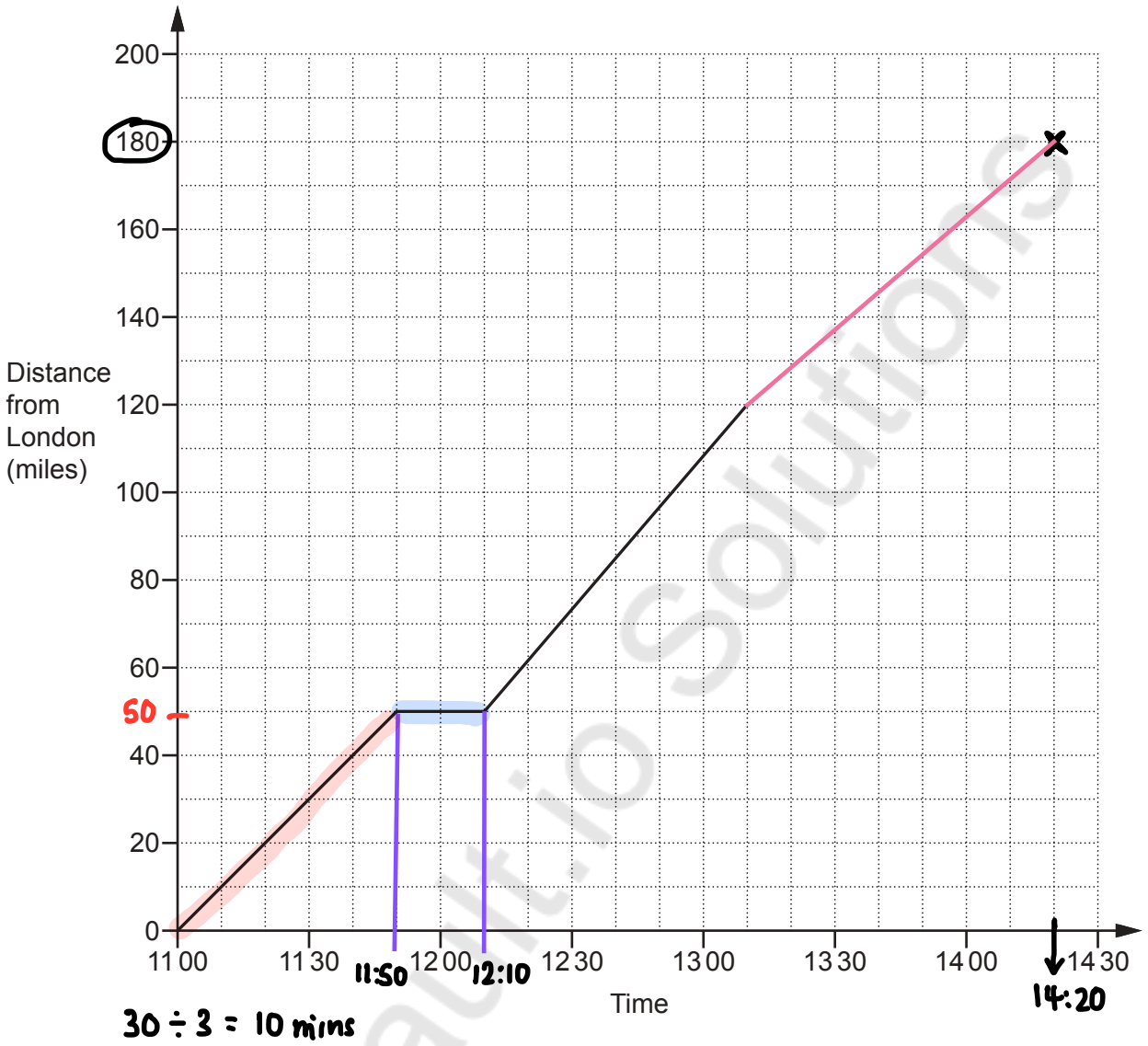
Total parts = 16

Total money = £375 x 16

= £6000

£ 6000 ..... [4]

13 This graph shows part of Lucy's car journey from London to Sheffield.
The car made one stop at a service station.



Use the graph to answer these questions.

(a) For how long did the car stop at the service station?

(a) 20 minutes **[1]**

(b) Work out the average speed of the car, in miles per hour, between London and the service station.

$S = \frac{D}{T}$

D = 50 miles

T = 50 mins $\xrightarrow{\div 60}$ 0.83̇h

$S = \frac{50}{0.83\dot{}}$

$= 60$

(b) 60 mph **[2]**

(c) Sheffield is 180 miles from London.
Lucy arrived in Sheffield at 14 20.

Complete the graph. **[2]**

14 Katy buys *x* cakes.
Gugu buys 3 times as many cakes as Katy.
Deanna buys 2 more cakes than Katy.

Each cake costs 85p. £0.85
The total cost of the cakes is £52.70.

How many cakes did each girl buy?

Katy = x

Gugu = $3 \times x$
$= 3x$

Deanna = $x + 2$

Total cakes = $x + 3x + x + 2$
$= 5x + 2$

Number of cakes = $52.7 \div 0.85$
$= 62$

$5x + 2 = 62$
$-2 \quad -2$
$5x = 60$
$\div 5 \quad \div 5$
$x = 12$

Katy: ..... 12 ..... cakes

Gugu: ..... 36 ..... cakes

Deanna: ..... 14 ..... cakes **[6]**

15 **(a)** Complete this table for $y = x^2 - 5$.

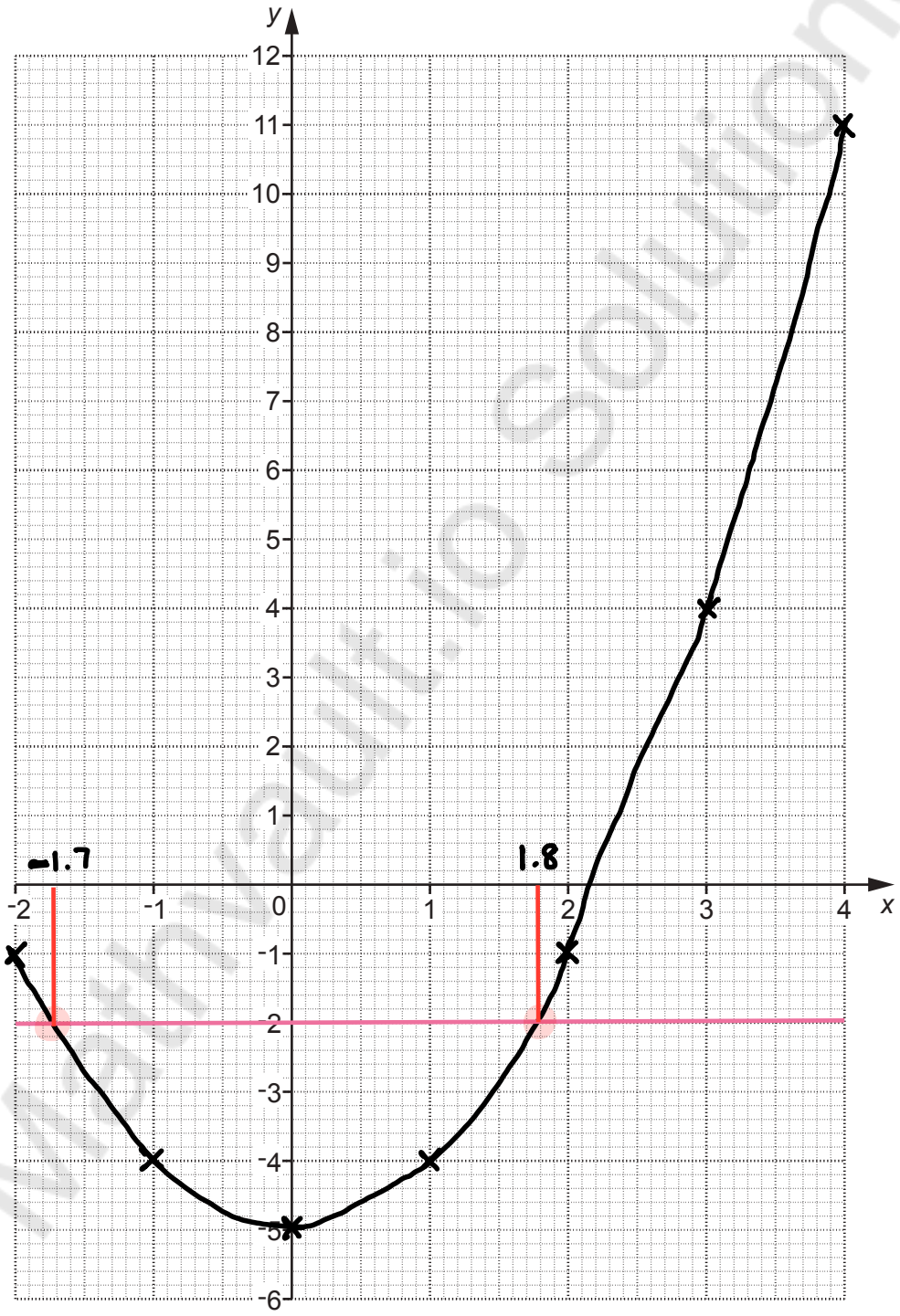
x	-2	-1	0	1	2	3	4
y	-1	-4	-5	-4	-1	4	11

$y = (3)^2 - 5 = 4$

$y = (-2)^2 - 5$ $\quad$ $y = (2)^2 - 5$

[2]

(b) On the grid below, draw the graph of $y = x^2 - 5$ for the values of x from -2 to 4.



[2]

(c) On the same grid, draw the line $y = -2$. **[1]**

(d) Write down the x coordinates of the points where $y = x^2 - 5$ and $y = -2$ cross.

(d) $x =$ -1.7 and $x =$ 1.8 **[2]**

16 Donald swims 3 lengths of a swimming pool in 93 seconds.

(a) Use this information to show that he could swim 100 lengths in under 55 minutes. **[4]**

3 lengths = 93 seconds
÷3 ÷3
1 length = 31 seconds
×100 ×100
100 lengths = 3100 seconds
÷60
51.6 mins

60s = 1m
÷60

(b) What assumption did you make in part **(a)**?

He swims at the same rate.

[1]

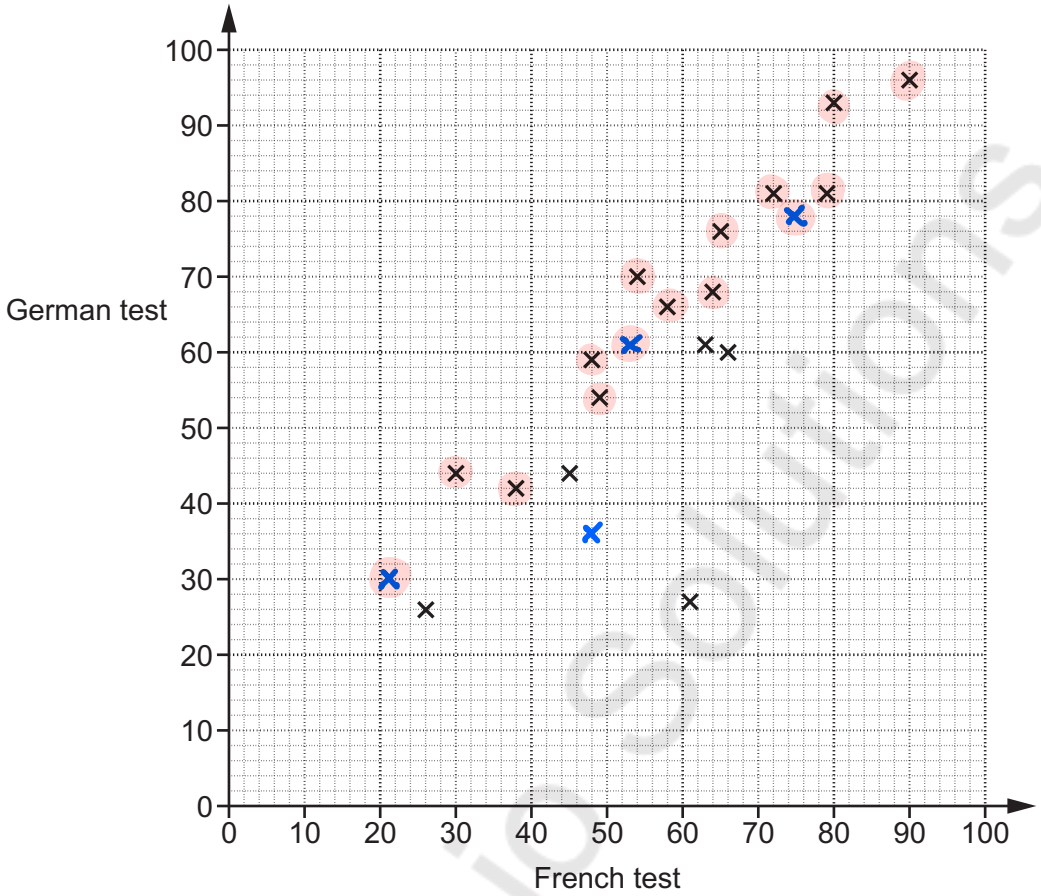
(c) Donald tries to swim the 100 lengths in under 55 minutes.

Suggest one reason why he might not achieve this.

He will get tired

[1]

17 The scatter diagram shows the results of 17 students in their French test and their German test. Both tests are out of 100.



(a) Here are the results of another 4 students.

French	21	75	48	53
German	30	78	46	61

Plot these results on the scatter diagram. **[2]**

(b) Describe the type and strength of the correlation shown in this diagram.

(b) Strong positive **[2]**

(c) Work out the percentage of the students whose German result was **higher** than their French result.

$\frac{15}{21} \times 100 = 71.\dot{4}2857\dot{1}$

(c) ..... 71.4 ..... % **[4]**

18 Maria mixes white paint and red paint in the ratio 2 : 3.
She makes a total of 15 litres of paint.

How much more red paint does she need to add to the mixture so that the ratio of white paint to red paint becomes 1 : 5?

W : R
2 : 3

Total = 5 parts

15 L ÷ 5 = 3 L per part

W : R
2 : 3
×3 ×3
6 L : 9 L

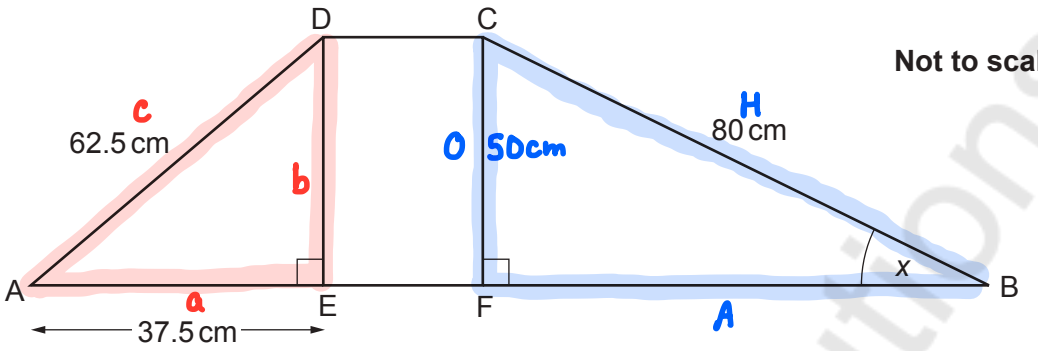
W : R
1 : 5
×6 ×6
6 L : 30 L

Red
30 L − 9 L = 21 L

..... 21 ..... litres **[4]**

19 In the diagram below, ABCD is a trapezium.
Length AE is 37.5 cm.
DE = CF

Find the value of angle *x*.



$a^2 + b^2 = c^2$

$37.5^2 + DE^2 = 62.5^2$

$-37.5^2 \qquad -37.5^2$

$DE^2 = 62.5^2 - 37.5^2$

$DE = \sqrt{62.5^2 - 37.5^2}$

$= 50$

SOH CAH TOA

$\sin\theta = \frac{O}{H}$

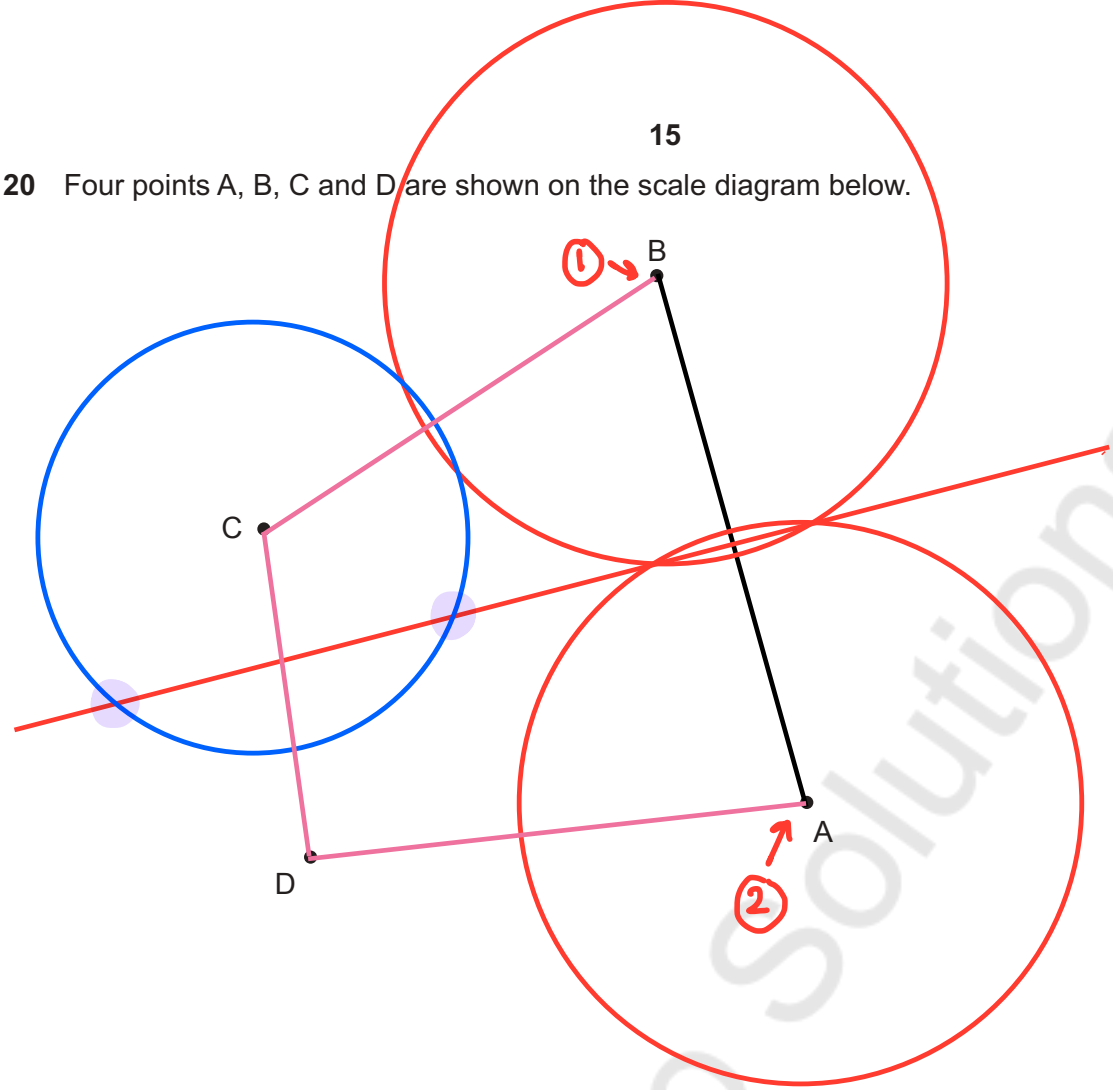
$\sin x = \frac{50}{80}$

$x = \sin^{-1}\left(\frac{50}{80}\right)$

$= 38.68218745$

$x =$ 38.7 ° **[6]**

20 Four points A, B, C and D are shown on the scale diagram below.



Scale: 1 cm represents 5 m

÷5

(a) On the diagram, construct and mark the two points that are

- the same distance from A and B perpendicular bisector

and

- 15 m from C.

÷5 = 3cm radius around C

Show all your construction lines. **[5]**

(b) The points A, B, C and D represent the four corners of Monty's garden.
His garden is bounded by four straight fences A to B, B to C, C to D and D to A.

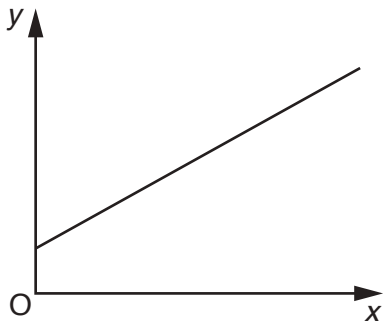
Monty wants to plant a tree in his garden at a place that satisfies the two conditions in part **(a)**.

Explain why there is only one position where Monty can plant his tree.

One of the points is not in his garden.

..... **[1]**

21 **(a)** A graph is drawn below.



✓ linear, ✗ (0,0)

Explain how you know that y is not directly proportional to x.

Line does not go through (0,0)

.....

.....

..... **[1]**

(b) q is directly proportional to r.
q is 68 when r is 20.

Work out q when r is 25.

$q \propto r$

$q = kr$

$68 = k(20)$

$\div 20 \quad \div 20$

$k = 3.4$

$q = 3.4r$

$q = 3.4(25)$

$= 85$

(b) 85 **[2]**

END OF QUESTION PAPER