OCR-F | Summer '25 | 2

1 Here is a list of numbers.

15 17 21 28 39 49

From this list, write down

(a) the prime number,

(a) 17 ✓ **[1]**

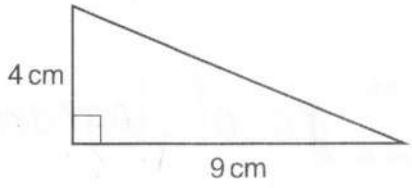
(b) the square number,

(b) 49 ✓ **[1]**

(c) **two** numbers with a difference of 18.

(c) 39 and 21 ✓ **[1]**

2 The diagram shows a right-angled triangle with base 9 cm and height 4 cm.



Not to scale

Work out the area of the triangle.

18 ✓ cm² **[2]**

4 x 9 ÷ 2 ✓

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3 Work out, giving your answers as fractions.

(a) Half of $\frac{1}{2}$



1/4 ✓

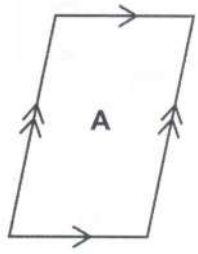
(a) ..... [1]

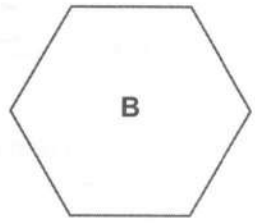
(b) $\frac{1}{5}+\frac{2}{5}$

3/5 ✓

(b) ..... [1]

4 **(a)** Shape **A** and shape **B** are drawn below.





(i) Write down the mathematical name of each of the shapes.

(a)(i) Shape **A** parallelogram ✓

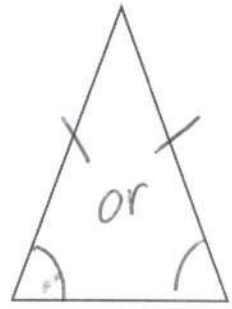
(regular) Shape **B** hexagon ✓

[2]

(ii) Write down the order of rotational symmetry of shape **A**.

(ii) 2 ✓ [1]

(b) Add correct notation to the shape below to show that it is an isosceles triangle.

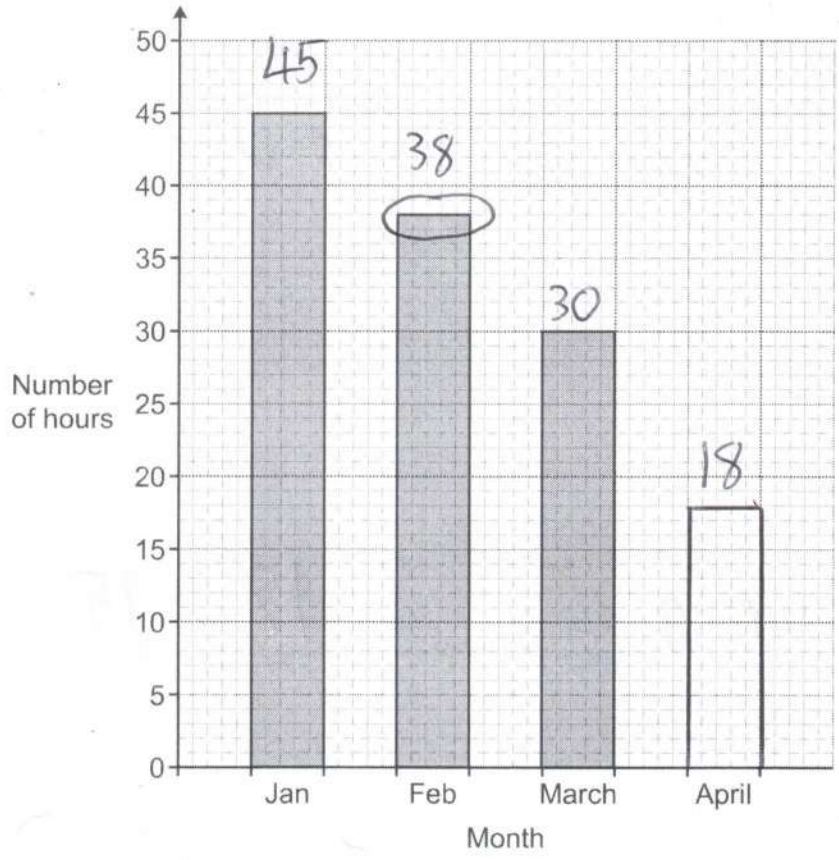


✓

[1]

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5 The bar chart shows the number of hours per month Riley spends at the gym in each of January, February and March.



(a) How many hours did Riley spend at the gym in February?

38

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

(b) Find how many **more** hours Riley spent at the gym in January compared to March.

45 - 30

15

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

(c) In April, Riley spent a total of 18 hours at the gym.

Complete the bar chart for April. **[1]**

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(d) Riley says,

18 30

I spent 50% less time at the gym in April than in March.

Is Riley correct?
Show how you decide.

50% of 30 = 15 ✓

Riley is wrong because 18 > 15 ✓

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

6 **(a)** Work out.

(i) $10 - 2 \times 3$

10 - 6

4 ✓

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

(ii) $-1 + 3^2$

-1 + 9

8 ✓

(ii) ..... **[1]**

(b) Insert **one** pair of brackets to make this calculation correct.

$6 \times (10 \div 2 - 4) = 6$ ✓

[1]

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7 **(a)** Write $\frac{4}{5}$ as a decimal.

0·8 ✓

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

(b) Write 0.06 as a percentage.

×100

6 ✓

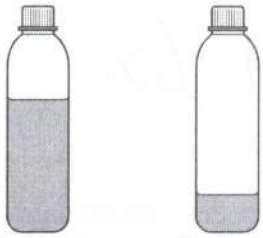
(b) ..... % **[1]**

(c) Write $\frac{16}{3}$ as a mixed number.

$5\frac{1}{3}$ ✓

(c) ..... **[1]**

8 Bottle **A** contains 1.5 litres of water and bottle **B** contains 100 millilitres of water.



Bottle **A**
1.5 litres

Bottle **B**
100 millilitres

Not to scale

Water is poured from bottle **A** into bottle **B** until both bottles contain the same amount.

How many millilitres of water are poured from bottle **A** into bottle **B**?

$\frac{1500+100}{2}$ = 800 ml in each ✓✓

700 ✓

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

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9 **(a)** Simplify.

$4x - 3y + x + 7y$

$5x + 4y$ ✓

(a) ..... **[2]**

(b) Multiply out.

(i) $5(2 - x)$

$10 - 5x$ ✓

(b)(i) ..... **[1]**

(ii) $2x(x + 3)$

✓ ✓

$2x^2 + 6x$

(ii) ..... **[2]**

10 By writing each number correct to **1** significant figure, find an estimate for this calculation.

$$\frac{3.81 \times 19.8}{2.1}$$

$$\frac{4 \times 20}{2}$$ ✓ ✓

$$= \frac{80}{2}$$

40 ✓

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

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11 Leo and Eve attempt the same puzzle.
Leo takes 1 minute 15 seconds to solve the puzzle.
Eve takes 2 minutes 5 seconds to solve the puzzle.

Write Leo's time as a fraction of Eve's time.
Give your answer in its simplest form.

$\frac{75}{125} = \frac{15}{25}$

$= \frac{3}{5}$

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

12 **(a)** A straight line has equation $y = 5x + 2$.

(i) Write down the gradient of the line.

(a)(i) 5 ..... **[1]**

(ii) Find the value of y when $x = 7$.

$5 \times 7 + 2$

(ii) 37 ..... **[1]**

(b) Make x the subject of $y = 5x + 2$.

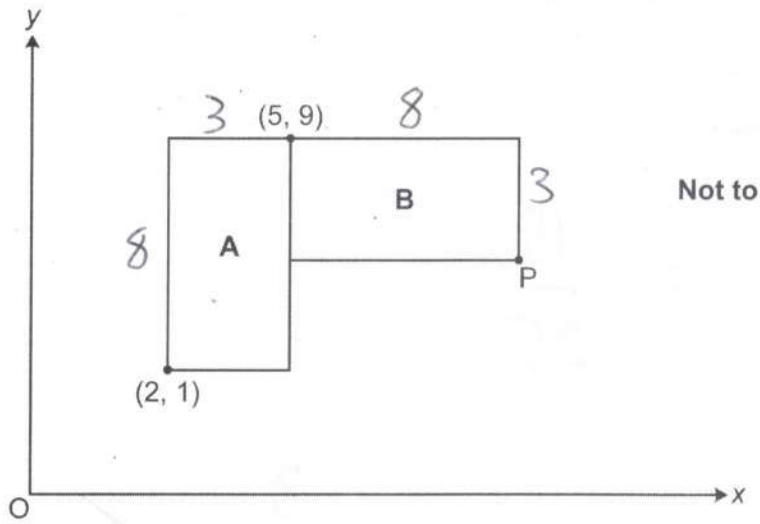
$y - 2 = 5x$

$x = \frac{y-2}{5}$

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

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13 The diagram shows rectangle **A** and rectangle **B**.
Rectangle **A** has two labelled vertices at the points (2, 1) and (5, 9).



Not to scale

Rectangle **A** is rotated 90° anticlockwise around the centre (5, 9) to form rectangle **B**.

Find the coordinates of the vertex marked P.

5+8 9-3

(13 , 6) **[3]**

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14 (a) Sundip has some £5, £10, £20 and £50 bank notes.
She buys 30 litres of fuel for her car.
One litre of fuel costs £1.50.

Sundip pays the exact amount of money for the fuel using three bank notes.

Work out the three bank notes that she uses to pay for the fuel.

$30 \times 1.5 = 45$ ✓✓

(a) £ 20 , £ 20 and £ 5 ✓ **[3]**

(b) On one journey, Sundip's car uses fuel at a rate of one litre every 16 kilometres.
At the start of the journey, her car has 50 litres of fuel.
At the end of the journey, her car has used $\frac{7}{10}$ of this fuel.

Use the conversion 5 miles = 8 kilometres to work out the number of **miles** Sundip travels on this journey.
You must show your working.

$\frac{7}{10} \times 50 \times 16 = 560$ Km ✓✓✓

$7 \times 80 = 560$ ✓

÷8

×5

(b) 350 ✓ miles **[5]**

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15 Work out.

(a) -3.5×-4

$3.5 \times 2 \times 2$

(a) 14 ✓ ..... [1]

(b) $0.1 \div 0.4$

$\frac{0.1}{0.4} = \frac{1}{4}$ or 0.25 ✓

(b) ..... [1]

16 An examination has two parts.
A student scores 10 out of 15 marks on Part 1.
They score 4 out of 10 marks on Part 2.

To pass the examination the student needs to score 54% of the total marks.

Show that the student passes the examination. **[3]**

Total $= \frac{14}{25} = \frac{56}{100} = 56\%$ ✓

$> 54\%$

✓ ✓

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17 Solve.

$2x - 1 \leqslant 11$

$2x \leqslant 12$ ✓

$x \leqslant 6$ ✓

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

18 $1\frac{1}{5} + \frac{22}{d} = 1\frac{3}{4}$

Find the value of d.

$\frac{7}{4} - \frac{6}{5} = \frac{22}{d}$ ✓

$\frac{35}{20} - \frac{24}{20} = \frac{22}{d}$

$\frac{11}{20} \overset{\times 2}{=} \frac{22}{d}$ ✓

$d =$ 40 ✓ **[3]**

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14
7 2

35
7 5

19 Sara and Tom both make a sequence of numbers.
The first term in both sequences is 10.

The term-to-term rule for Sara's sequence is add 14.
The term-to-term rule for Tom's sequence is add 35.

Each sequence stops when a term reaches or goes above 500.

(a) Find the **number of terms** that are the same in both Sara's and Tom's sequence.
You must show your working.

LCM = 7 x 5 x 2 = 70 ✓

10, 80, 150, 220, 290, 360 ✓
430, 500 ✓

8 ✓

(a) ..... **[4]**

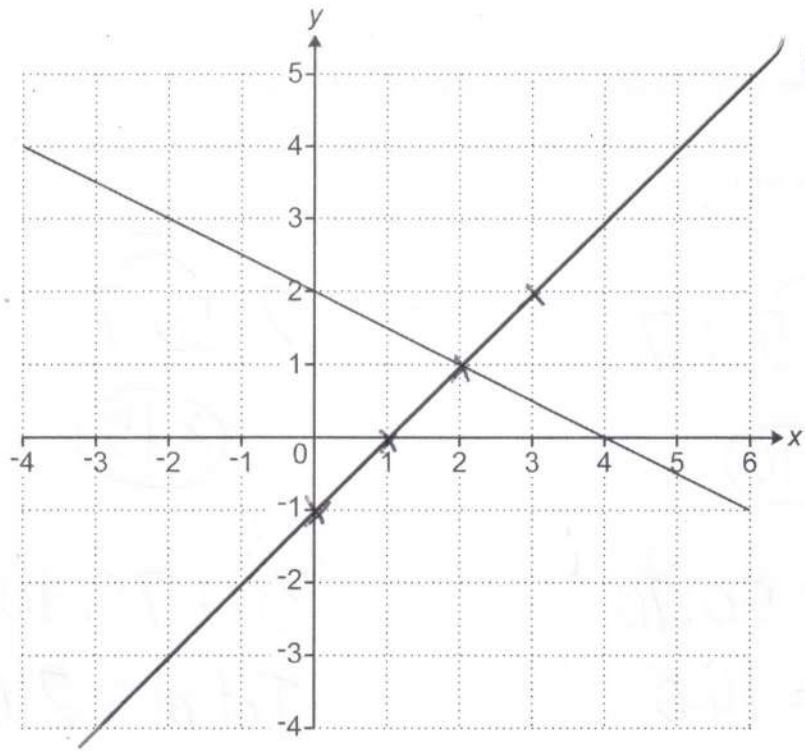
(b) Find an expression for the *n*th term of Sara's sequence.

-4 ↷ 10, 24, 38 (+14)
14 28 42

(b) 14n − 4 **[2]**
✓ ✓

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20 The graph of the line $y = 2 - \frac{1}{2}x$ is shown on this grid.



By drawing a suitable line on the grid, solve these simultaneous equations.

$y = 2 - \frac{1}{2}x$ and $y = x - 1$ m = 1 c = -1

$x =$ 2

$y =$ 1

[4]

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21 Three lengths of wood are in the ratio 2 : 5 : 7.
The difference in size between two of the lengths of wood is 30 cm.

Kofi says,

The sum of the three lengths of wood **must be** at least 120 cm.

Is Kofi correct?
Show how you decide.

3
2 : 5 : 7
×10
20 : 50 : 70
Total = 140

2
2 : 5 : 7
×15
30 : 75 : 105
Total = 210 ✓✓✓

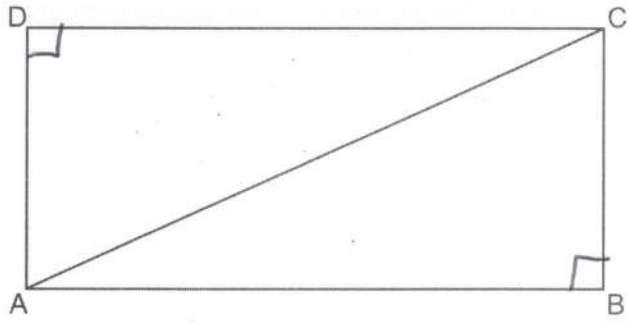
5
2 : 5 : 7
×6
12 : 30 : 42
Total = 84 ✓

Kofi is incorrect because 84 is a possible total ✓

..... [5]

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22 The diagram shows a rectangle ABCD with diagonal AC.



Not to scale

Complete each statement to show that triangle ABC is congruent to triangle ADC.

Angle ADC = angle CBA because both angles are 90°.

Side AD = side BC because opposite sides of a rectangle are equal.

Side CD = side AB because opposite sides of rectangles are equal

The above three statements show that triangle ABC is congruent to triangle ADC because of SAS

[4]

23 Work out.

2^{-4}

$\frac{1}{2^4}$ $2 \times 2 \times 2 \times 2$

$\frac{1}{16}$

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

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24 A school has three terms, Autumn, Spring and Summer.

In class A there were 90 absences in the Autumn term, 120 absences in the Spring term and 40 absences in the Summer term.

Compared to class A, class B had:

- $\frac{3}{10}$ fewer absences in the Autumn term
- 5% more absences in the Spring term
- 7 more absences in the Summer term.

Design and complete a two-way table to show this information. **[6]**

Headings ✓✓

	Au	Sp	Su
A	90	120	40
B	63	126	47

✓✓✓

3 by 2 ✓

$\frac{7}{10} \times 90 = \frac{63}{1} = 63$

10% of 120 = 12

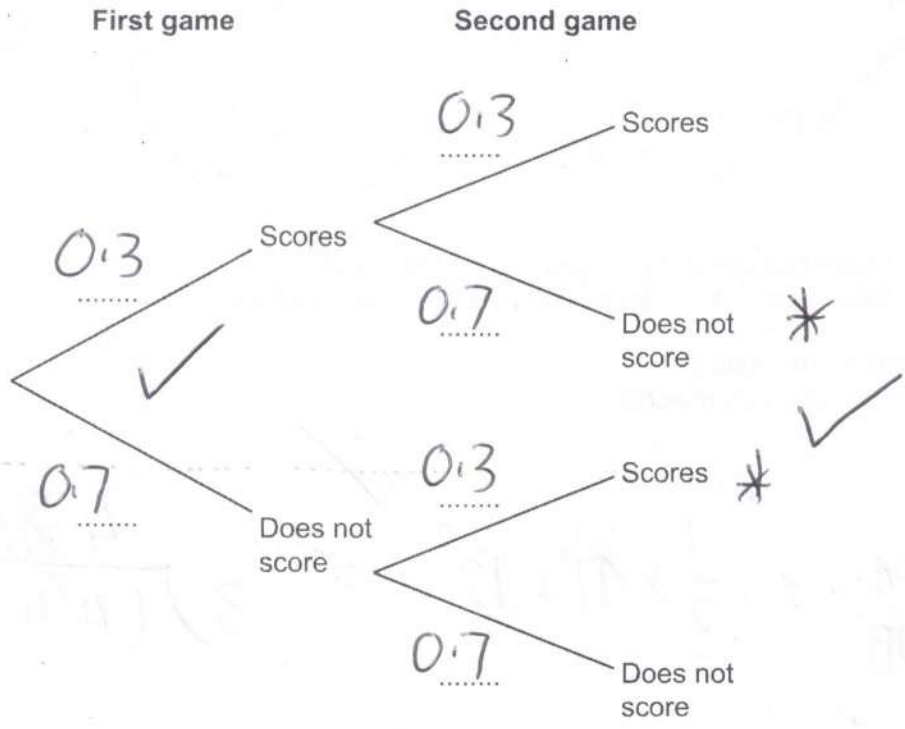
5% of 120 = 6

120 + 6 = 126

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25 Casey plays two games of football.
In each game, the probability that Casey scores a goal is 0.3 .

(a) Complete the tree diagram.



[2]

(b) Work out the probability that Casey scores in only one of the games.

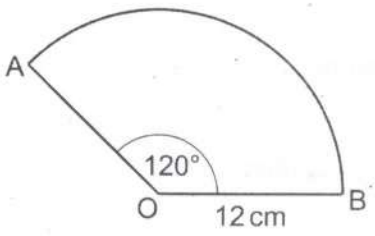
$(0.3 \times 0.7) + (0.7 \times 0.3)$

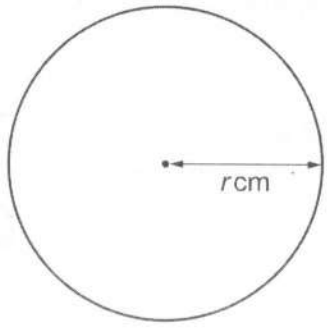
$0.21 + 0.21$

(b) 0.42 **[3]**

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26 The diagram shows a sector of a circle AOB and a circle with radius r cm.





Not to scale

The sector has radius 12 cm and angle AOB = 120°.
The ratio of the area of the sector AOB to the area of the circle is 3 : 4.

Calculate the value of r.
You must show your working.

Area AOB $= \frac{1}{3} \times \pi \times 12^2 = 3\overline{)48\pi}$ ✓ ✓

$48\pi : \pi r^2$ ✓

(×16) 3 : 4 (×16) ✓

$4 \times 16 = r^2$

$64 = r^2$

8 ✓

$r =$ ..... **[6]**

END OF QUESTION PAPER

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