

2 (a) Write down the next term in each of these sequences.

(i) 7 11 15 19

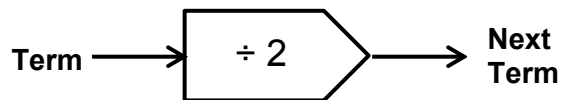
(a)(i) [1]

(ii) 1 3 6 10

(ii) [1]

(b) (i) The first term of a sequence is 12.

This is the rule for the sequence.

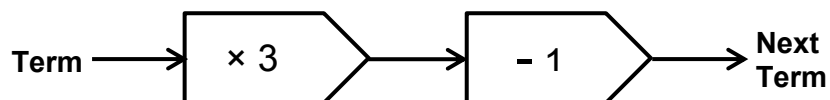


Write down the next two terms in the sequence.

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

(ii) The first term in a different sequence is 2.

This is the rule for this sequence.



Write down the next two terms in this sequence.

(ii) [1]

3 Football teams get 3 points for a win, 1 point for a draw and no points for a loss.

Churchton United have played 32 games and have a total of 57 points.
They have drawn 6 of their games.

How many games have they lost?

..... [4]

4 The factors of 14 are 1, 2, 7 and 14.

(a) Write down all the factors of 20.

(a) [2]

(b) Explain why 17 is a prime number.

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

(c) Elizabeth says

All numbers have an even number of factors.

Explain why Elizabeth is wrong.

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

- 5 (a) Two numbers are in the ratio 5 : 7.
The difference between the numbers is 12.

Work out the two numbers.

(a)and.....[2]

- (b) Three numbers have a mean of 9 and a mode of 7.

Work out the three numbers.

(b).....and.....and.....[2]

- 6 (a) Round 341.537

(i) to 2 decimal places,

(a)(i) [1]

(ii) to 1 significant figure.

(ii) [1]

- (b) Work out an estimate for

$$\frac{32.7 \times 4.1}{19.28}$$

(b) [2]

7 (a) Use the formula $V = p^3$ to find V when $p = 2$.

(a) [1]

(b) Harvey is given this problem.

S is a positive whole number.
Use the formula $S = \sqrt{ab}$ to find S when $a = 4$ and $b = 9$.

This is what Harvey wrote.

$$S = \sqrt{ab}$$

$$S = \sqrt{49}$$

$$S = 7$$

Harvey has made an error.

Explain the error that Harvey has made and give the correct answer.

.....

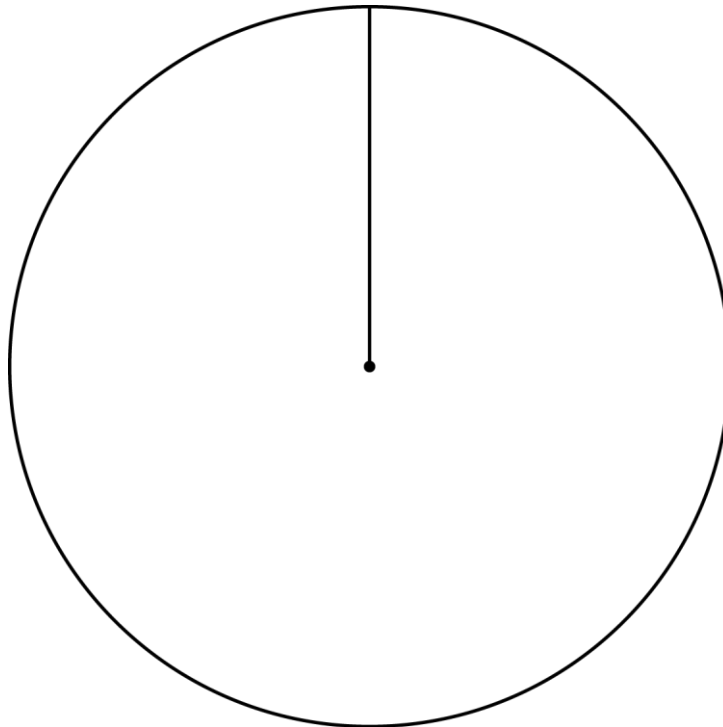
 [2]

8 Sophia was asked how she spends her leisure time.

She replied

- I play football for $\frac{1}{4}$ of the time
- I meet with my friends for $\frac{2}{5}$ of the time
- I use my tablet for $\frac{3}{20}$ of the time
- I listen to music for the rest of the time.

(a) Complete the pie chart showing how Sophia spends her leisure time.



[4]

(b) What fraction of her leisure time does Sophia spend listening to music?

(b) [1]

9 (a) Convert 485 cm to metres.

(a) m[1]

(b) (i) Zara says

10 litres = 18 pints.

Use Zara's conversion to convert 25 litres into pints.

(b)(i).....pints[2]

(ii) Jacob says

5 miles = 8 kilometres.

Use Jacob's conversion to convert 44 kilometres into miles.

(ii)miles[2]

- 10 (a)** A bag contains only green counters and black counters in the ratio 2 : 7.
There are 45 counters in the bag.

How many counters are black?

(a) [2]

- (b)** A different bag contains only red counters, blue counters and yellow counters in the ratio 4 : 6 : 11.

There are 54 blue counters.

- (i)** How many counters are red?

(b)(i) [2]

- (ii)** A counter is taken at random from the bag.

What is the probability that it is yellow?

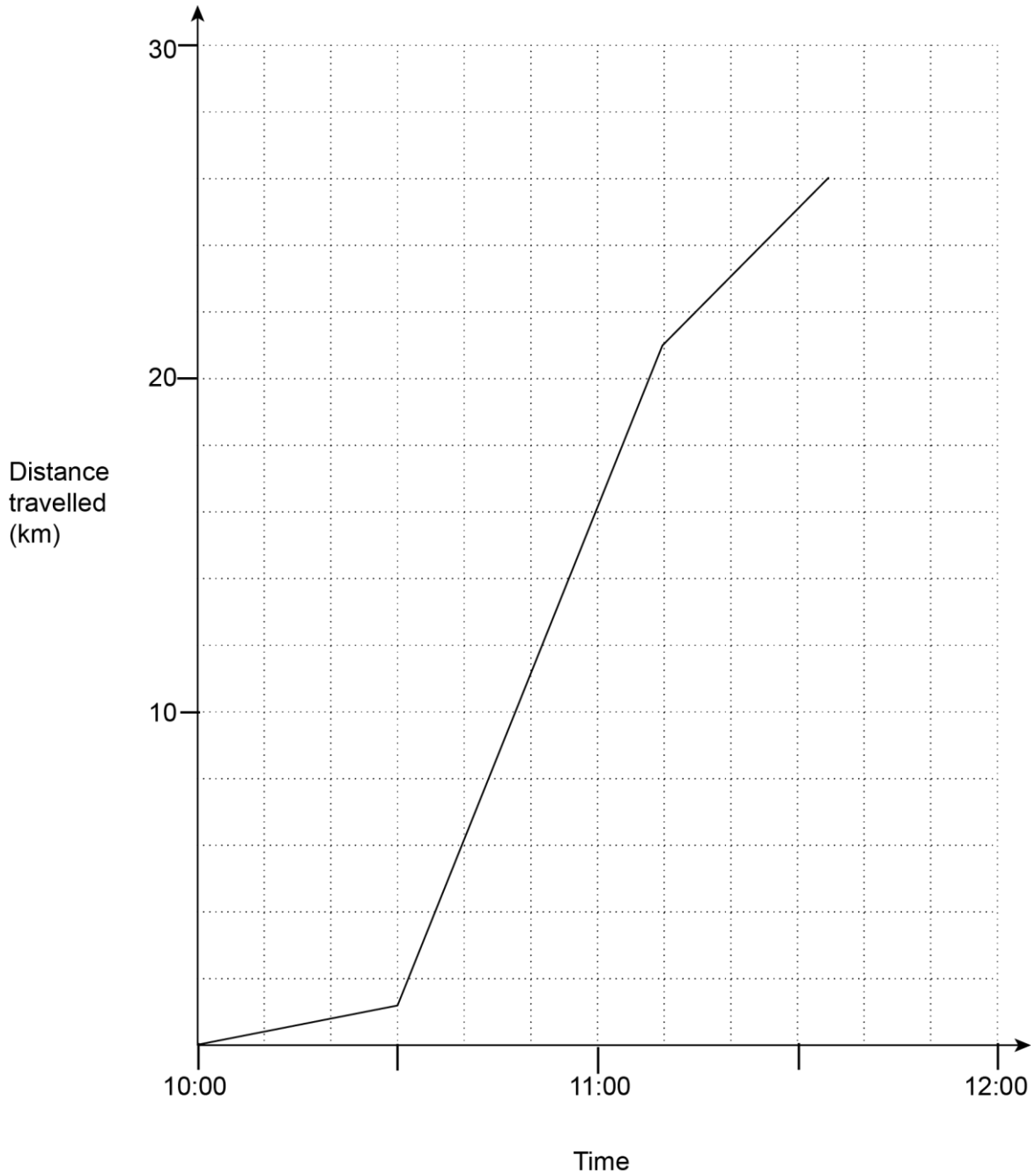
(ii) [1]

- (c)** A different bag contains only purple counters and orange counters in the ratio $x : y$.
A counter is taken at random from the bag.

Complete the following statement with an algebraic expression.

The probability that this counter is purple is..... [2]

- 11 Rohit completed a triathlon. In the triathlon he swam first, then cycled and finally ran. He was given this record of his triathlon.



- (a) State one assumption that was made when the graph was drawn.

.....
 [1]

- (b) How far did Rohit run?

(b)km [1]

(c) How long did Rohit cycle for?

(c)minutes [1]

(d) Work out Rohit's average speed when he was cycling.
Give your answer in km per hour.

(d)km per hour [3]

12 (a) A ship travels at a constant speed.
The ship travels 60 miles in 2 hours 30 minutes.

How far does it travel in 6 hours?

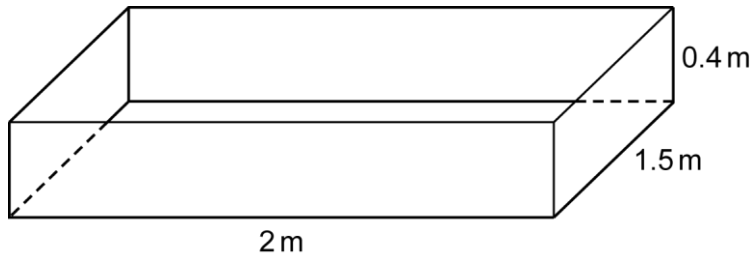
(a)miles [3]

(b) y is inversely proportional to x .
 $x = 5$ when $y = 12$.

Work out y when $x = 20$.

(b) [2]

- 13 Lily has an empty pool that is a cuboid with a height of 0.4 m.



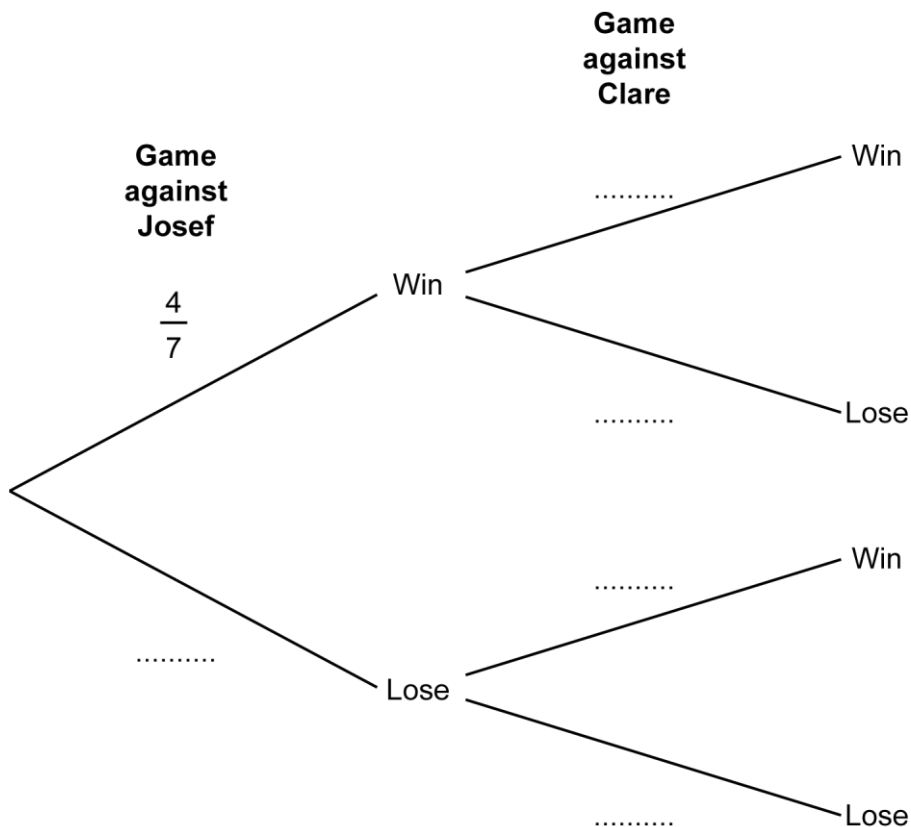
She fills the pool at a rate of 20 litres per minute.

How long does it take to fill the pool to a depth of 0.3 m?
[1000 litres = 1 m³]

..... minutes **[5]**

- 14 Kyle plays in a chess league.
 He has to play Josef and then play Clare.
 The probability of winning against Josef is $\frac{4}{7}$.
 The probability of winning against Clare is $\frac{3}{5}$.
 Kyle does not draw any games.

(a) Complete the tree diagram.



[2]

(b) What is the probability that Kyle will win both games?

(b) [2]

(c) What is the probability that Kyle will win exactly one of the two games?

(c) [3]

15 (a) Simplify.

$$a^3b \times a^2b^3$$

(a) [1]

(b) Factorise.

$$x^2 - 36$$

(b) [1]

(c) (i) Factorise.

$$x^2 - 2x - 15$$

(c)(i) [2]

(ii) Solve.

$$x^2 - 2x - 15 = 0$$

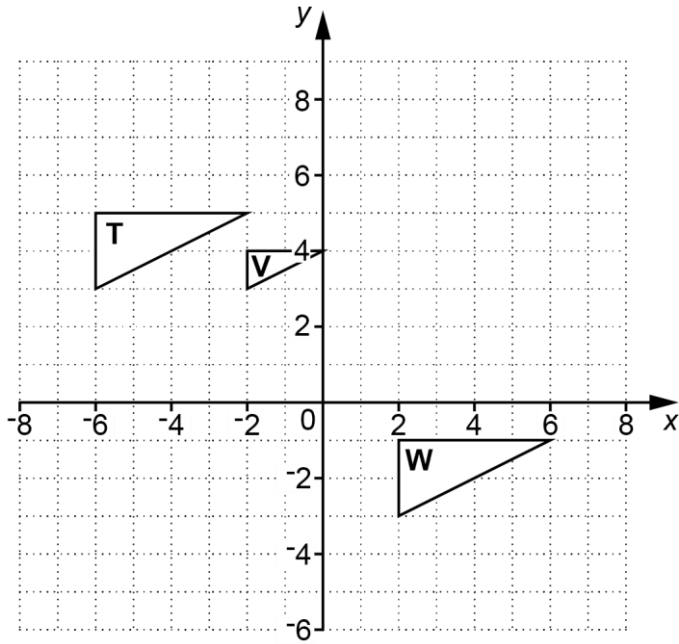
(ii) [1]

- 16** Aimee receives a 20% salary increase.
Her new salary is £18 000.

What was Aimee's salary before the increase?

£..... [3]

17 Three triangles are drawn on a coordinate grid.



(a) (i) Draw the image of triangle **T** after a reflection in the line $y = 0$. [2]

(ii) Draw the image of triangle **T** after a rotation 90° clockwise about $(0, 0)$. [2]

(b) (i) Describe fully the **single** transformation that maps triangle **T** onto triangle **W**.

 [2]

(ii) Describe fully the **single** transformation that maps triangle **T** onto triangle **V**.

 [3]

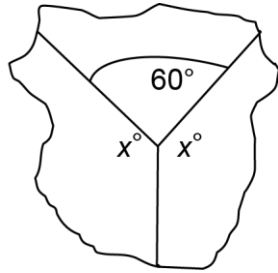
(c) Heather says

Any transformation always produces a shape that is congruent to the original shape.

Is her statement correct? Explain your reasoning.

..... [1]

18 Three **regular** polygons meet at a point.

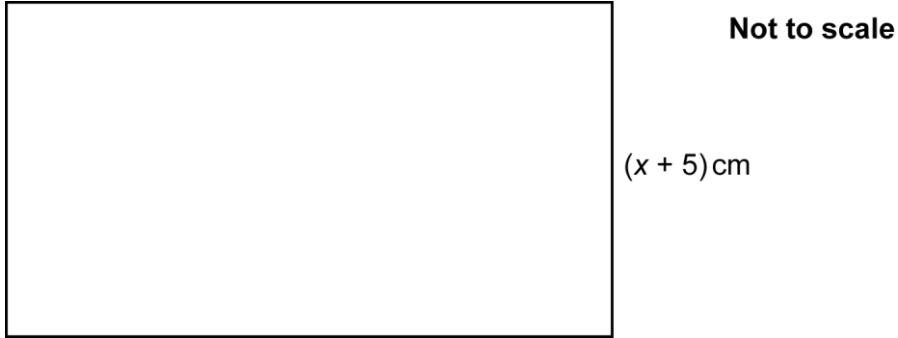


Not to scale

Find the number of sides of each of the three regular polygons in the diagram.

.....and.....and.....[6]

- 19 The width of this rectangle is $(x + 5)$ cm.



The ratio width : length for this rectangle is 1 : 2.
The perimeter of the rectangle is 48 cm.

Calculate the area of the rectangle.

..... cm²[6]

END OF QUESTION PAPER

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