

1 (a) Write 210 as a product of its prime factors.

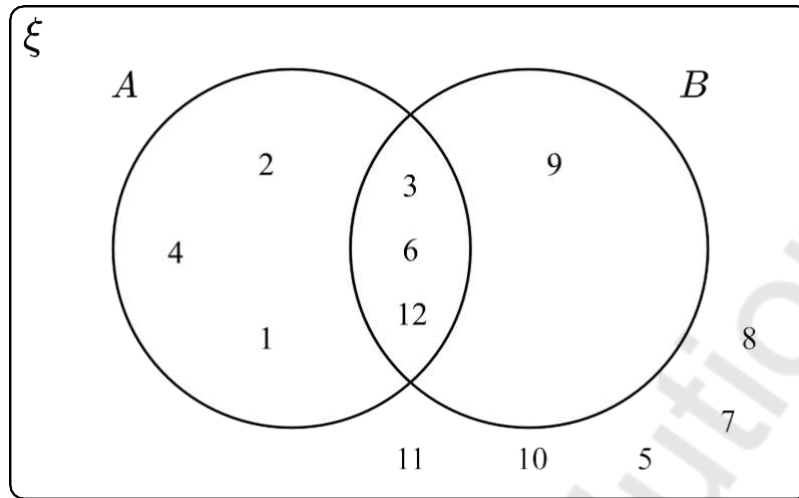
(2)

(b) Find the highest common factor (HCF) of 210 and 90

(2)

(Total for Question 1 is 4 marks)

2 Here is a Venn diagram



(a) Write down the numbers that are in the set A'

(1)

(b) A number is chosen at random from the universal set.
Find the probability that the number is in the set $A \cap B$

(2)

(Total for Question 2 is 3 marks)

3 Write these numbers in order of size, starting with the smallest.

3.15×10^4

3.15×10^{-2}

3.15×10^{-1}

3150

(Total for Question 3 is 2 marks)

4 Work out $1\frac{3}{4} + 2\frac{1}{3}$

Give your answer as a mixed number in its simplest form.

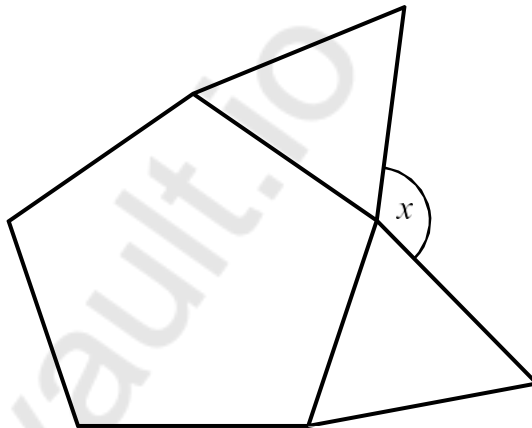
(Total for Question 4 is 2 marks)

- 5 In a sale, prices are reduced by 40%
The sale price of a laptop is £360
Work out the original price of the laptop

£

(Total for Question 5 is 2 marks)

- 6 Here is a regular pentagon and two equilateral triangles

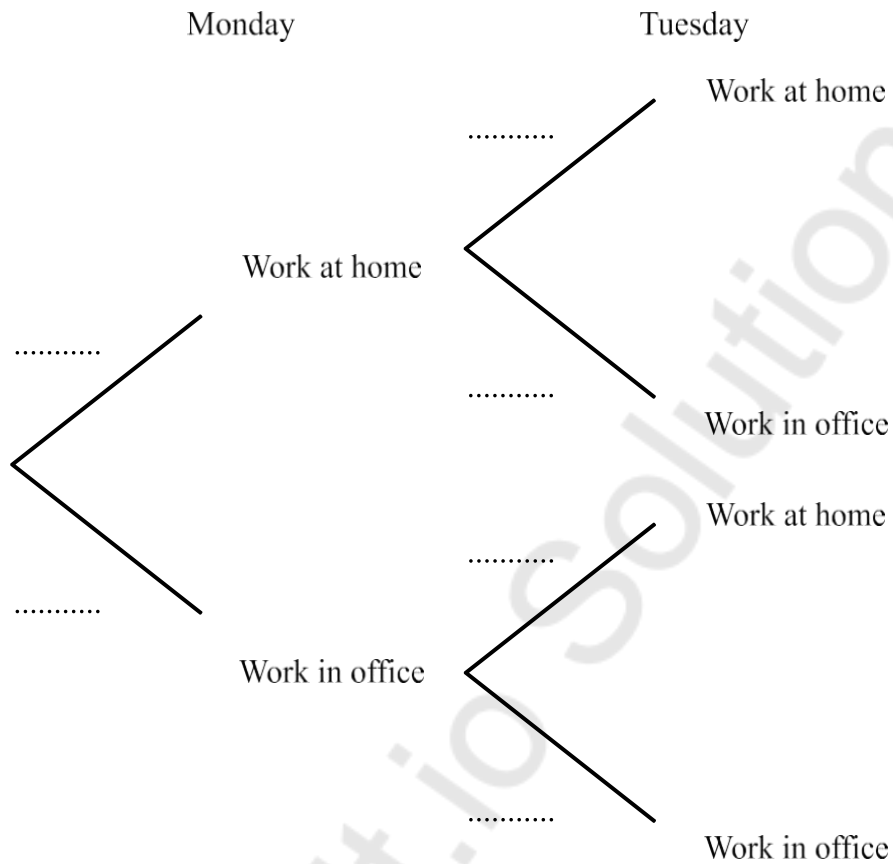


Show that angle x is 132°

(Total for Question 6 is 3 marks)

7 The probability that Faraz will work from home on any given day is p

The probability that Faraz works at home on Monday and Tuesday is $\frac{49}{100}$



(a) Complete the tree diagram

(3)

(b) Work out the probability that Faraz works in the office on Wednesday, Thursday and Friday

(3)

(Total for Question 7 is 6 marks)

8 (a) Work out the value of $\frac{5^5 \times 5^{-2}}{5}$

(2)

(b) Find the value of 2^{-3}

(1)

(c) Find the value of $125^{\frac{1}{3}}$

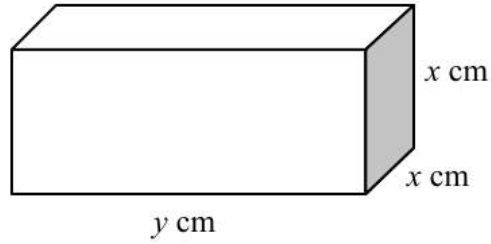
(1)

(Total for Question 8 is 4 marks)

9 Solve $x^2 = 3x + 10$

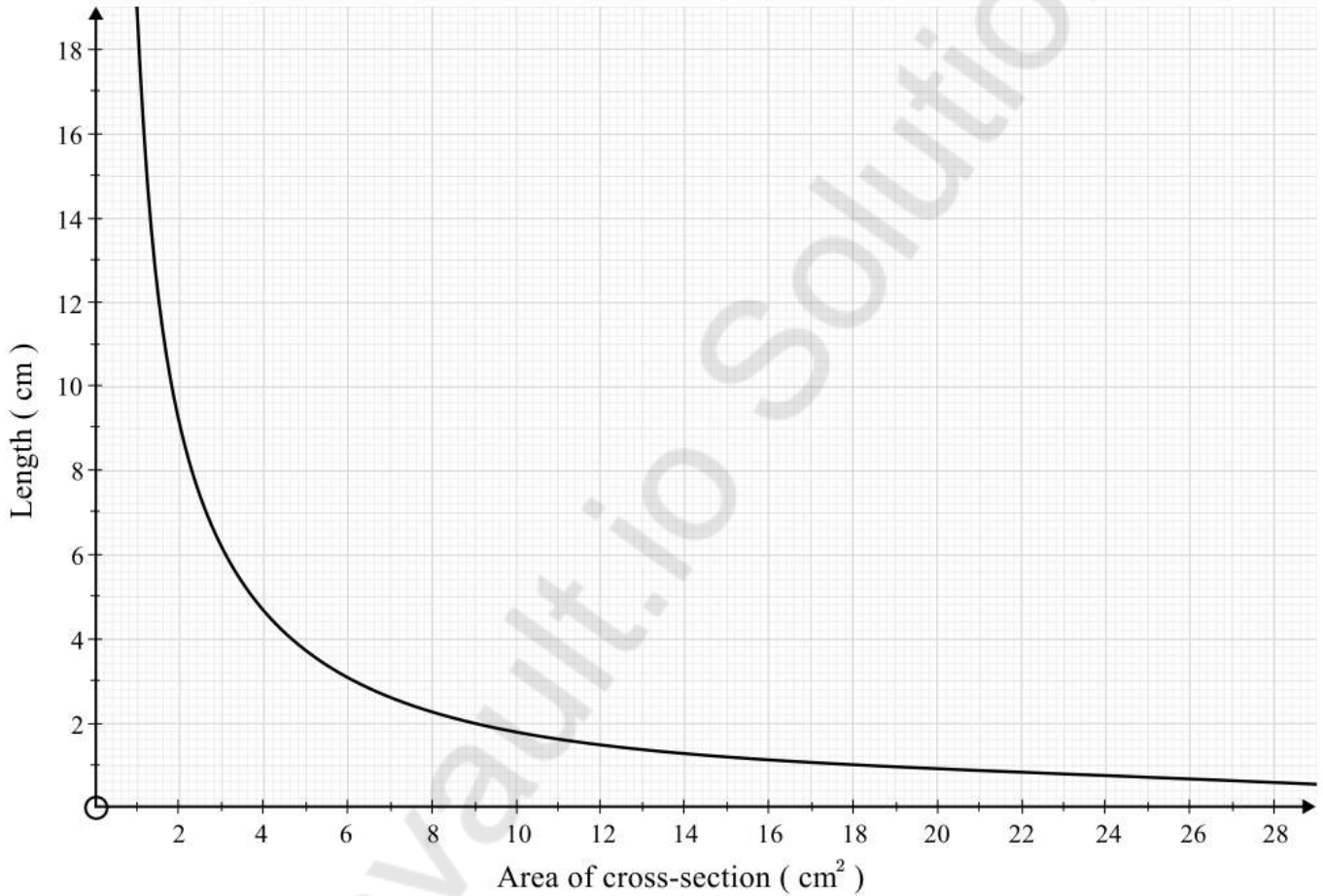
(Total for Question 9 is 3 marks)

10 Here is a cuboid with a square cross-section.



The cuboid has a fixed volume, $V \text{ cm}^3$.

This graph shows some information about the cuboid.



(a) Use the graph to complete this table:

Area of cross-section	1		3	6	12	
Length	18	9				1

(2)

(b) Write down the volume, V , of the cuboid.

 cm^3

(1)

(c) Work out the surface area of the cuboid when the length of the cuboid is 2cm.

..... cm²

(4)

(Total for Question 10 is 7 marks)

11 Richard and Jamie coach a football team.

This year they have taken the training sessions in the ratio 11:14.

Jamie says he has taken more than 60% of the coaching sessions.

Is Jamie correct?

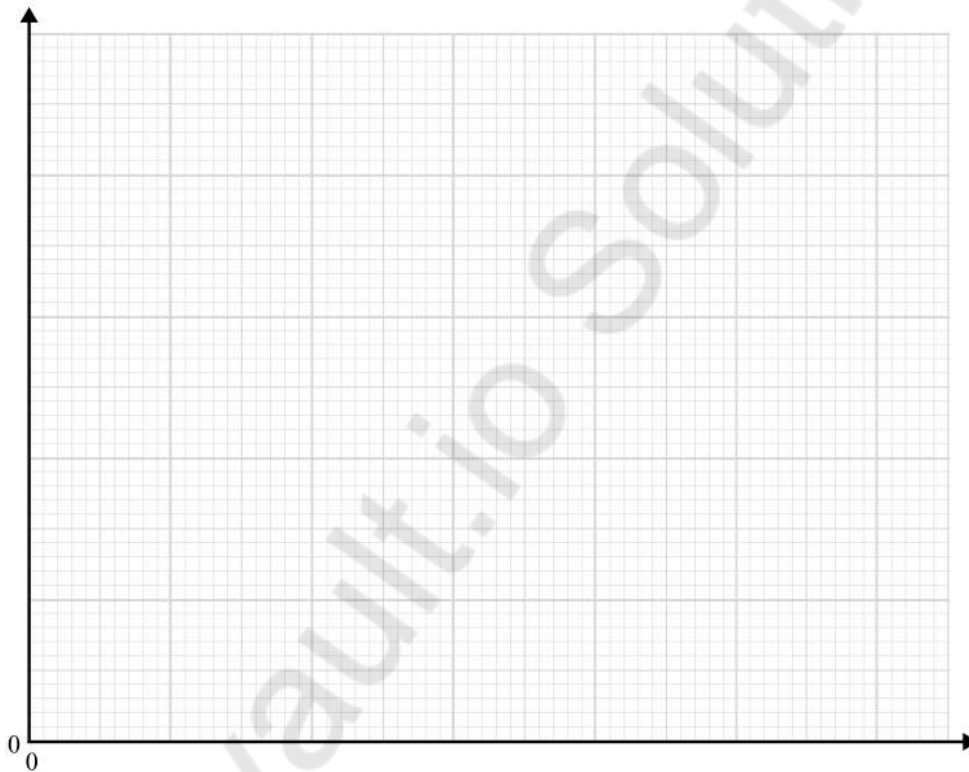
Show how you decide.

.....
(Total for Question 11 is 3 marks)

12 The table shows information about the number of hours worked in a week by some adults.

Number of hours (h)	Frequency
$0 \leq h < 15$	45
$15 \leq h < 25$	32
$25 \leq h < 35$	42
$35 \leq h < 40$	25
$40 \leq h < 60$	50

(a) On the grid draw a histogram to show this information.



(3)

(b) Work out an estimate for the fraction of these adults who work between 30 and 40 hours.

(2)

(Total for Question 12 is 5 marks)

13 Work out $0.\dot{6}\dot{8} - 0.\dot{1}\dot{2}$

Give your answer as a fraction in its simplest form.

(Total for Question 13 is 4 marks)

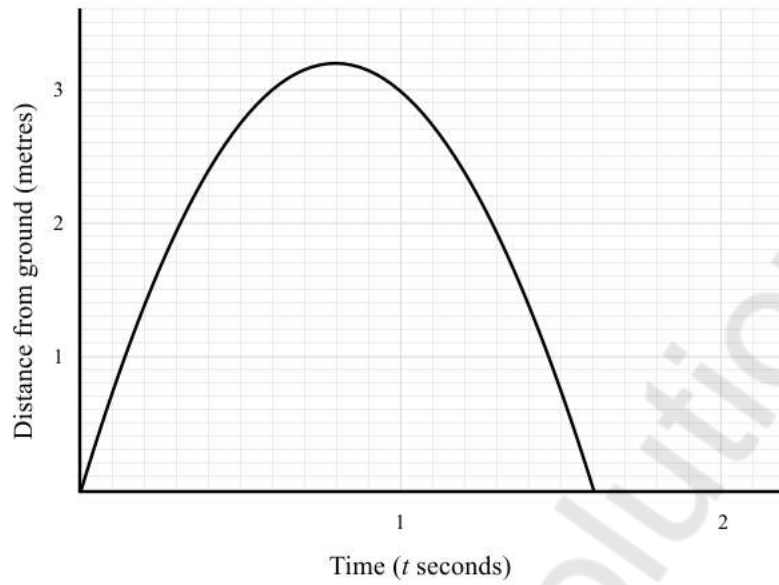
14 y is directly proportional to x^2

When $x = 10$, $y = 36$

Work out the value of y when $x = 3$

(Total for Question 14 is 3 marks)

- 15 A ball is thrown in the air. This distance-time graph shows how far the ball is above the ground.

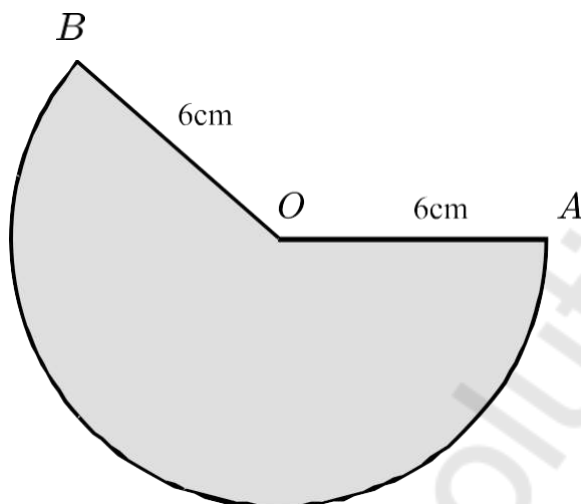


Work out an estimate for the gradient of the graph when $t = 1$

You must show how you get your answer.

(Total for Question 15 is 3 marks)

16 OAB is a sector of a circle, radius 6cm.



The length of the arc is 7π cm.

Work out, in terms of π , the area of the sector.

Give your answer in its simplest form.

.....
cm²

(Total for Question 16 is 4 marks)

17 Make p the subject of the formula $r = \frac{7(2p + 1)}{5p - 3}$

(Total for Question 17 is 4 marks)

18 Lara has some 5p coins and some 10p coins.

The total value of the coins is £2.10.

The ratio of 5p coins:10p coins is 5:1.

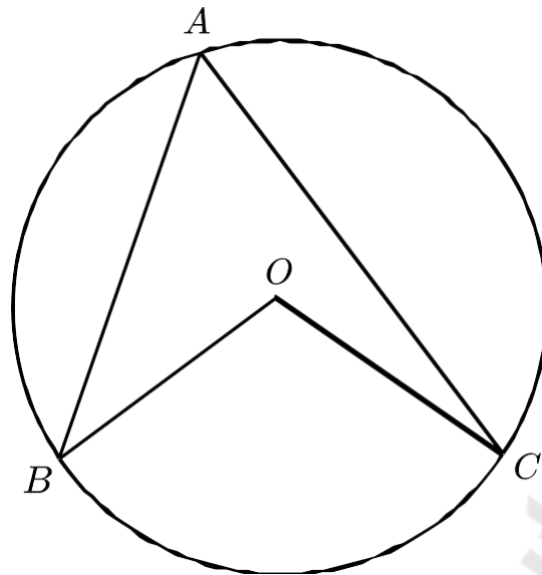
Work out how many 5p coins and how many 10p coins Lara has.

5p coins: -----

10p coins: -----

(Total for Question 18 is 4 marks)

19

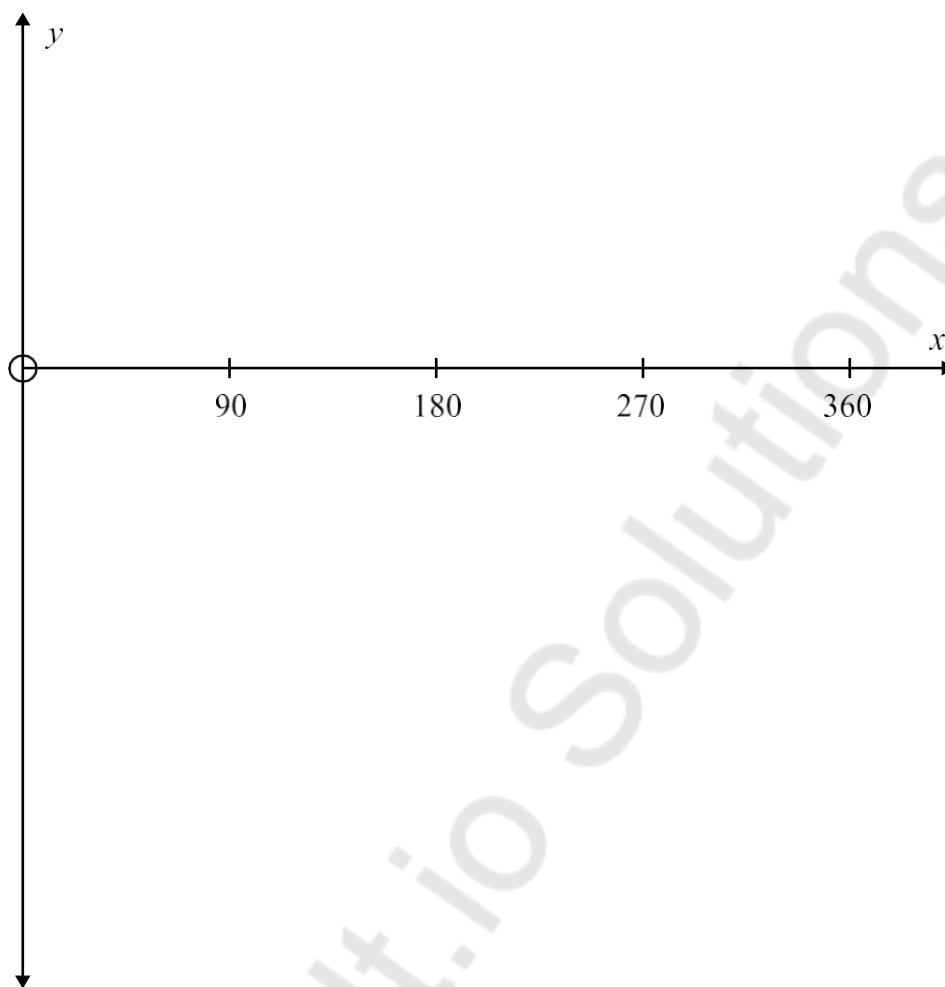


Prove that angle BOC is double angle BAC .

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(Total for Question 19 is 4 marks)

20 (a) Sketch the graph of $y = \sin(x)$ for $0 \leq x \leq 360$



(2)

(b) Write down the value of x between 0° and 180° for which $\sin(x) = \cos(x)$

(1)

(Total for Question 20 is 3 marks)

21 The functions f , g and h are such that

$$f(x) = x^2 - 3$$

$$g(x) = 5x - x^2$$

$$h(x) = x + 3$$

(a) Find $h^{-1}(7)$

(2)

(b) Find the set of values for x such that $f(x) < g(x) < h(x)$

(5)

