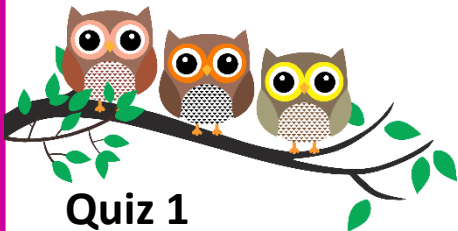


# Higher Interleaving Quiz

## Branch 4

### Quizzes 1 to 3



#### Quiz 1

Q	Topic	$\Sigma$	R	A	G
1	Ratio Problem				
2	Regional Inequalities				
3	Circle Theorem				
4	Frequency Tree				

#### Home Study Focus

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Home Study  
Completed

#### Quiz 2

Q	Topic	$\Sigma$	R	A	G
1	Reverse Percentage				
2	Difference of Two Squares				
3	Volume and Mass				
4	Histogram				

#### Home Study Focus

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Home Study  
Completed

#### Quiz 3

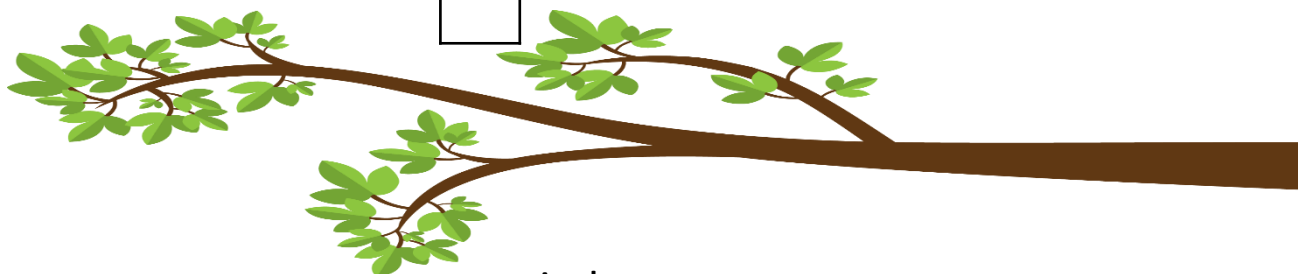
Q	Topic	$\Sigma$	R	A	G
1	Standard Form				
2	Iteration				
3	Area Problem				
4	Venn Diagram				

#### Home Study Focus

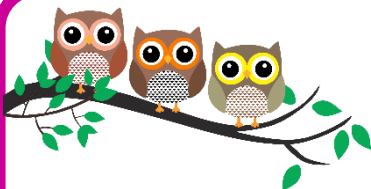
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Home Study  
Completed



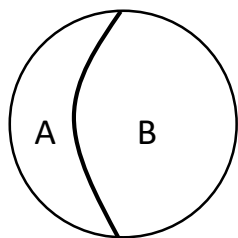
# Higher Interleaving Quiz



## Branch 4 Quiz 1

- 1) The diagram shows a circle split into two regions: A and B.

(4 marks)



The ratio of the area of the regions A and B are 1:3.  
The radius of the circle is 10cm.  
Calculate the area of region B  
Leave your answer in terms of pi.

$$\text{Area of Circle} = \pi r^2 = \pi \times 10^2 = 100\pi \text{ cm}^2$$

$$1 \text{ part: } 100\pi \div 4 = 25\pi$$

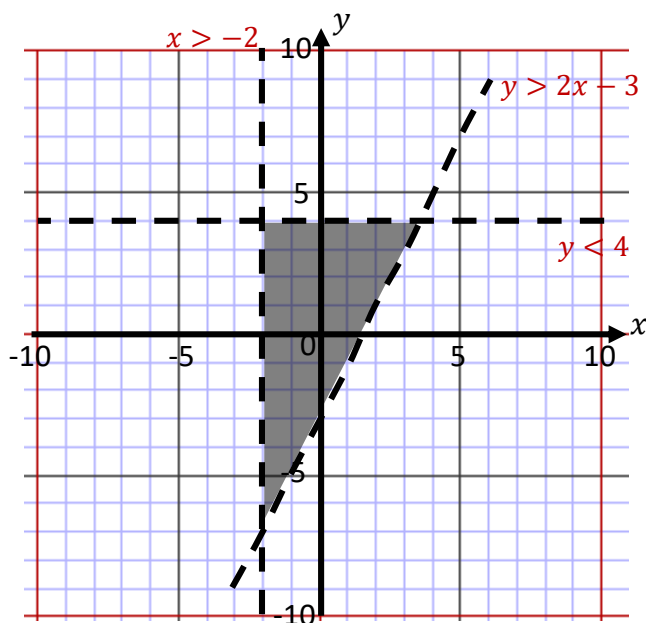
$$\text{Region A: } 25\pi \times 1 = 25\pi$$

$$\text{Region B: } 25\pi \times 3 = 75\pi$$

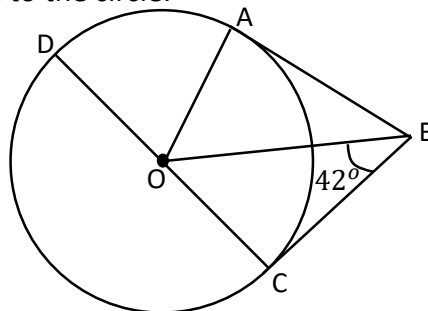
Answer:  $75\pi \text{ cm}^2$

- 2) On the grid shade the region that satisfies all three of these inequalities. (3 marks)

$$x > -2, \quad y < 4 \quad \text{and} \quad y > 2x - 3$$



- 3) A, C and D are points on the circumference of a circle, centre O. CD is a diameter. AB and BC are tangents to the circle.



Work out the size of the angle DOA. Give reasons for your answer.

Angle DOA:  $84^\circ$  (4 marks)

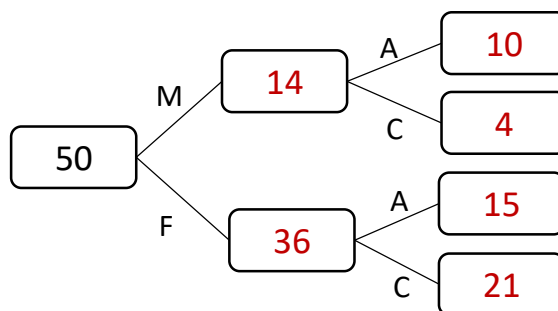
$OCB = 90^\circ$  because the angle between a tangent and a radius in a circle is  $90^\circ$ .

$BOC = 180 - (90 + 42) = 48^\circ$  (angles in a triangle total  $180^\circ$ )

$AOB = 48^\circ$  because of congruent triangles.

$DOA = 180 - (48 + 48) = 84^\circ$  (angles on a straight line at a point total  $180^\circ$ )

- 4) 50 passengers were on a bus.  
14 people were male.  
Male adults to children were in the ratio of 5:2  
25 adults in total.  
a) Complete the frequency tree. (3 marks)

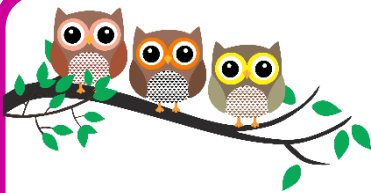
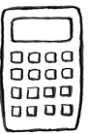


- b) What proportion of the passengers were children?  $\frac{21 + 4}{50} = \frac{25}{50} = \frac{1}{2} = 50\%$  (1 marks)

Answer: \_\_\_\_\_

Q	Topic	$\Sigma$	R	A	G
1	Ratio Problem				
2	Regional Inequalities				
3	Circle Theorem				
4	Frequency Tree				

# Higher Interleaving Quiz



## Branch 4 Quiz 2

- 1) In a sale, the original price of a coat was reduced by  $\frac{1}{5}$ . **(3 marks)**

The sale price of the bag is £43.20.  
Work out the original price.

$$100\% - 20\% = 80\% \qquad \frac{1}{5} = 0.2 = 20\%$$

$$80\% = 43.20 \qquad \text{or} \qquad 43.20 \div 0.8 = \text{£}54$$

$$10\% = 5.4$$

$$100\% = 54$$

Answer:                      **£54**

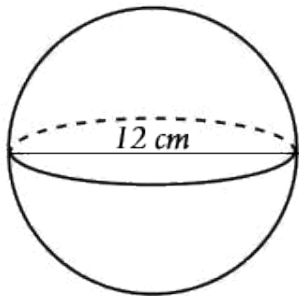
- 2) Factorise and solve  $4x^2 - 49 = 0$  **(3 marks)**

$$(2x + 7)(2x - 7) = 0$$

Answer:                       $x = -\frac{7}{2} = -3.5$      $x = \frac{7}{2} = 3.5$

- 3) a) Calculate the volume of the sphere. **(2 marks)**

$$\text{Volume of sphere} = \frac{4}{3}\pi r^3$$



$$V = \frac{4(\pi \times 6^3)}{3}$$

$$V = 288\pi$$

Answer:                       **$V = 904.78 \text{ cm}^3$**

- b) The sphere has density of  $0.4\text{g/cm}^3$ .  
Calculate the mass of the object. **(2 marks)**

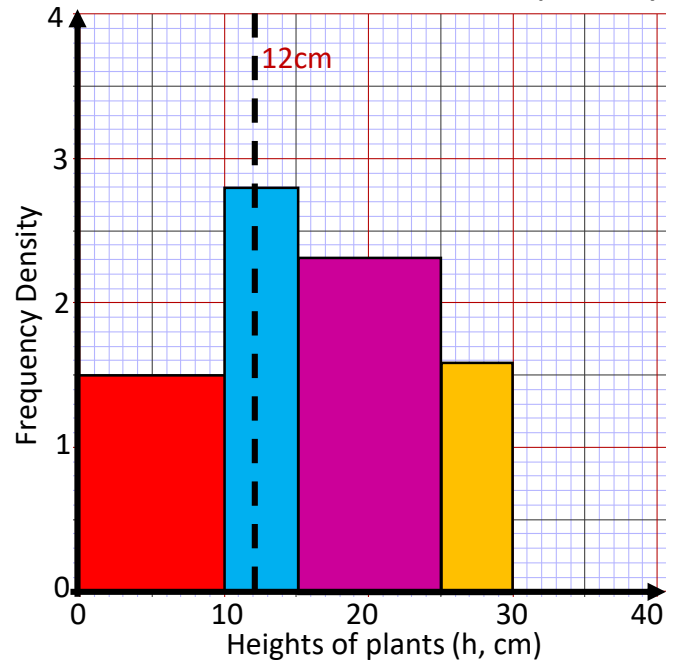
$$904.78 \times 0.4$$

Answer:                      **361.91 g**

- 4) The heights of 60 plants were recorded by a gardener. The results are shown in the table.

Height ( $h$ ) in cm	Frequency	Class Width	F.D.
$0 < h \leq 10$	15	10	1.5
$10 < h \leq 15$	14	5	2.8
$15 < h \leq 25$	23	10	2.3
$25 < h \leq 30$	8	5	1.6

- a) On the grid, draw a histogram for the information in the table. **(3 marks)**



- b) Plants can only be sold if they're taller than 12cm. The gardener says he can sell on 70% of his crop. Is he correct? **(2 marks)**

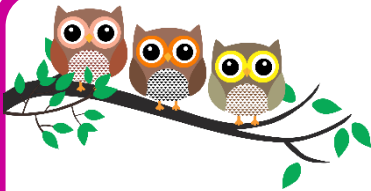
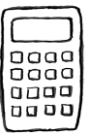
$$\text{Less than } 12\text{cm} = 15 + (2.8 \times 2) = 20.6$$

$$\text{More than } 12\text{cm} = \frac{39.4}{60} \times 100 = 65.7\%$$

He is **incorrect** he can only sell on approximately 65.7% of his crop.

Q	Topic	$\Sigma$	R	A	G
1	Reverse Percentage				
2	Difference of Two Squares				
3	Volume and Mass				
4	Histogram				

# Higher Interleaving Quiz



## Branch 4 Quiz 3

1) A teacher asks Faheem and Ella to convert 20 257 into standard form.

a) Faheem writes  $20.257 \times 10^3$  (1 mark)  
Criticise Faheem's answer.

20.257 should be 2.0257 as it has to be between 0 and 10 to be in standard form.

b) Ella writes  $2.0257 \times 10^{-4}$  (1 mark)  
Criticise Ella's answer.

Should be  $2.0257 \times 10^4$  the power should be positive and not negative.

2) An approximate solution to an equation is found using this iterative process.

$$x_{n+1} = \frac{x_n^3 - 5}{8} \text{ and } x_1 = 0$$

Work out the solution to 3 decimal places.

$$x_2 = \frac{ans^3 - 5}{8} = -0.625 \quad (3 \text{ marks})$$

$$x_3 = -0.6555175781 \quad x_8 = -0.661119658$$

$$x_4 = -0.6602097579$$

$$x_5 = -0.6609712748$$

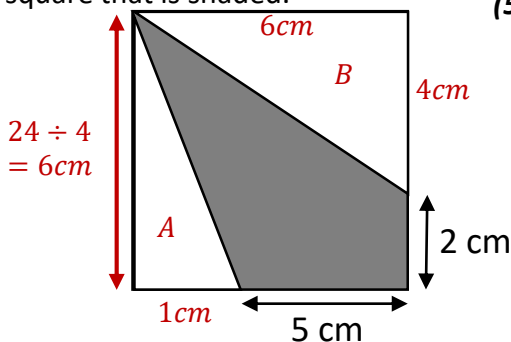
$$x_6 = -0.6610958913$$

$$x_7 = -0.6611163113$$

Answer: -0.661

3) The diagram shows a square with perimeter 24cm.

Work out the proportion of area inside the square that is shaded. (5 marks)



Area of square  $6 \times 6 = 36\text{cm}^2$

Area A =  $\frac{1 \times 6}{2} = 3\text{cm}^2$

Area B =  $\frac{4 \times 6}{2} = 12\text{cm}^2$

Area of shaded  $36 - (3 + 12) = 21\text{cm}^2$

Answer:  $\frac{21}{36} = \frac{7}{12}$

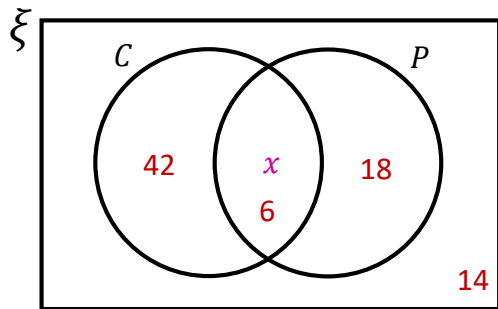
4) In the Venn diagram

$\xi = 80$  orchards

C = Orchards growing cherries

P = Orchards growing plums

(5 marks)



60 orchards grow only cherries or plums.

$\frac{7}{10}$  of these 60 orchards grow only cherries.

The number of orchards that grow cherries is double the number that grow plums.

Complete the Venn Diagram.

$$\frac{60}{10} \times 7 = 42 \text{ grow only cherries}$$

$$60 - 42 = 18 \text{ grow only plums}$$

*cherry orchard = 2 × plum orchard*

$$x + 42 = 2(x + 18)$$

$$x + 42 = 2x + 36$$

$$42 = x + 36$$

$$x = 42 - 36 = 6$$

Not a plum or cherry orchard

$$80 - (42 + 6 + 18) = 14$$

Q	Topic	$\Sigma$	R	A	G
1	Standard Form				
2	Iteration				
3	Area Problem				
4	Venn Diagram				