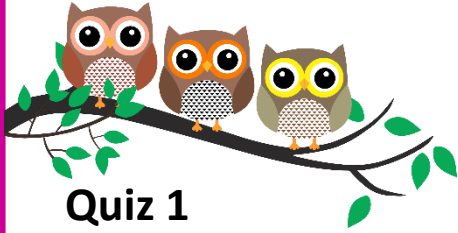


Higher Interleaving Quiz

Answers

Branch 3

Quizzes 1 to 3



Home Study Focus

Quiz 1

Q	Topic	Σ	R	A	G
1	Ratio Problem				
2	Simultaneous Equation				
3	Circle Theorem				
4	Frequency Tree				

Home Study Completed

Quiz 2

Q	Topic	Σ	R	A	G
1	Reverse Percentage				
2	Expand and Simplify				
3	Right-Angled Trigonometry				
4	Probability Tree				

Home Study Completed

Quiz 3

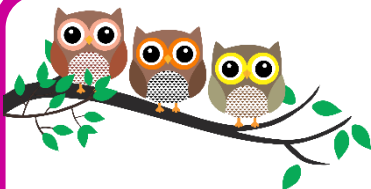
Q	Topic	Σ	R	A	G
1	Compound Interest				
2	Functions				
3	Transformations				
4	Histogram				

Home Study Completed



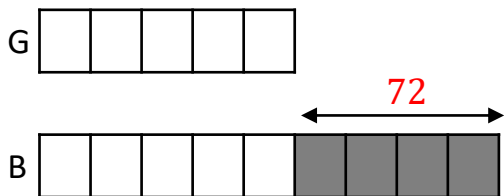
Higher Interleaving Quiz

Answers



Branch 3 Quiz 1

- 1) In year 11 at school the ratio of girls: boys = 5:9
There are 72 more boys than girls.
Work out the total number of students in year 11. (3 marks)



$$72 \div 4 = 18$$

$$18 \times 14 = 252$$

Answer: 252

- 2) Solve

$$\begin{aligned} 2x + 3y &= 19.5 \\ x - y &= -1.5 \end{aligned} \quad (3 \text{ marks})$$

$$\begin{aligned} 3x - 3y &= -4.5 \\ 2x + 3y &= 19.5 \end{aligned}$$

ST OP $5x = 15$

$$x = 3$$

$$2x + 3y = 19.5$$

$$2(3) + 3y = 19.5$$

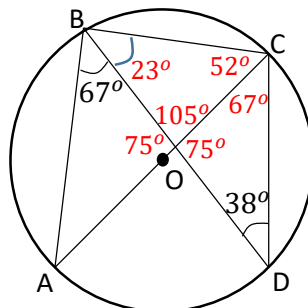
$$6 + 3y = 19.5$$

$$3y = 13.5 \Rightarrow y = 4.5$$

$$x = \underline{3}$$

$$y = \underline{4.5}$$

- 3) A, B, C and D are points on the circumference of a circle, centre O. AC is a diameter.



Work out the size of the following angles, giving reasons for your answers

- a) Angle ACD: 67° (2 marks)

Angles subtended on same chord are equal.

- b) Angle ACB: 52° (3 marks)

$CBA = 90^\circ$ angles in a semi-circle. $CBD = 90 - 67 = 23^\circ$

Angles in a triangle $67 + 38 = 105$ $180 - 105 = 75^\circ$

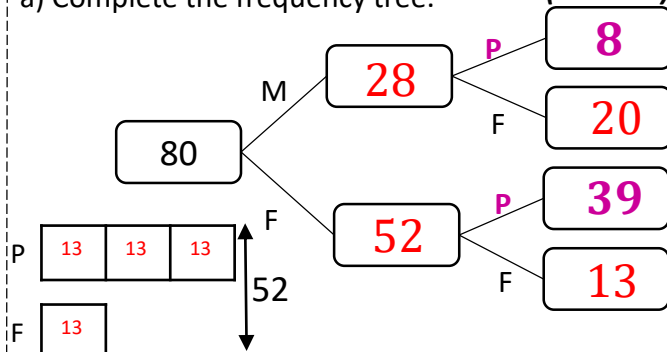
Vertically opposite angles are the same.

Angles around a point $360 - 150 = 210$ $210 \div 2 = 105^\circ$

Angles in a triangle $105 + 23 = 128$ $180 - 128 = 52^\circ$

- 4) 80 people took a test.
52 people were female.
Females passed and failed in the ratio of 3:1.
47 people passed in total.

- a) Complete the frequency tree. (2 marks)



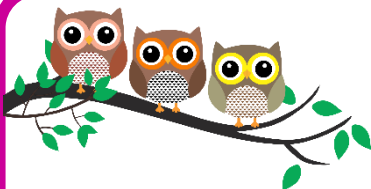
- b) What proportion of males passed the test? (2 marks)

Answer: $\frac{8}{28} = \frac{2}{7} \approx 28.6\%$

Q	Topic	Σ	R	A	G
1	Ratio Problem				
2	Simultaneous Equation				
3	Circle Theorem				
4	Frequency Tree				

Higher Interleaving Quiz

Answers



Branch 3 Quiz 2

1) When water freezes to make ice it increases in volume by 9%. $100\% + 9\% = 109\%$
What volume of water is needed to make 327cm^3 of ice? **(3 marks)**

$$327 \div 1.09 = 300$$

Answer: 300cm³

2) Expand and simplify **(3 marks)**
 $(2x - 1)(x + 4)(2x + 5)$

$$(2x^2 + 7x - 4)(2x + 5)$$

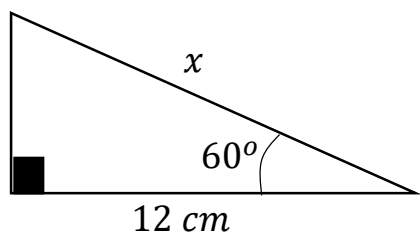
$$= 4x^3 + 14x^2 + 10x^2 - 8x + 35x - 20$$

Or $(2x - 1)(2x^2 + 13x + 20)$

$$= 4x^3 + 26x^2 - 2x^2 + 40x - 13x - 20$$

Answer: $4x^3 + 24x^2 + 27x - 20$

3) Work out the length of x **(3 marks)**



$$\cos(60) = \frac{12}{x}$$

$$x = \frac{12}{\cos(60)} = \frac{12}{0.5} = 24$$

Answer: 24cm

4) 10 counters in a bag. 4 red, 3 green, 2 pink and 1 blue.



Ella picks a counter at random from the bag, notes the colour and then puts it back in the bag.

a) Ella uses this method to work out the probability of selecting 2 greens in a row.

She writes: "There are four colours, so the probability of selecting a green is

$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}, \text{ so the probability is } \frac{1}{2}."$$

a) Make two criticisms of Ella's method. **(2 marks)**

Criticism 1: **There are not an equal amount of the four counters in the bag.**

The probability for a green is $\frac{3}{10}$.

Criticism 2: **She added the probabilities together.**

She should have multiplied the probabilities together.

b) Calculate the probability of selecting two counters of the same colour. **(4 marks)**

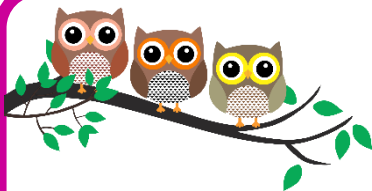
$$P(RR) = \frac{4}{10} \times \frac{4}{10} = \frac{16}{100} \quad P(PP) = \frac{2}{10} \times \frac{2}{10} = \frac{4}{100}$$

$$P(GG) = \frac{3}{10} \times \frac{3}{10} = \frac{9}{100} \quad P(BB) = \frac{1}{10} \times \frac{1}{10} = \frac{1}{100}$$

$$P(\text{same}) = \frac{16}{100} + \frac{9}{100} + \frac{4}{100} + \frac{1}{100} = \frac{30}{100}$$

Answer: $\frac{30}{100}$

Q	Topic	Σ	R	A	G
1	Reverse Percentage				
2	Expand and Simplify				
3	Right-Angled Trigonometry				
4	Probability Tree				



Higher Interleaving Quiz

Answers

Branch 3 Quiz 3

- 1) David invested £8600 for 5 years in a savings account. He was paid 2.6% compound interest per annum. **(3 marks)**
How much did David have after 5 years?

Multiplier is 1.026

$$8600 \times 1.026^5 = 9777.667288$$

Answer: £9777.67

- 2) The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = 4x$$

$$g(x) = 5 + 2x$$

- a) Calculate the value of $g(-3)$. **(1 mark)**

$$5 + 2(-3) = 5 - 6 = -1$$

Answer: -1

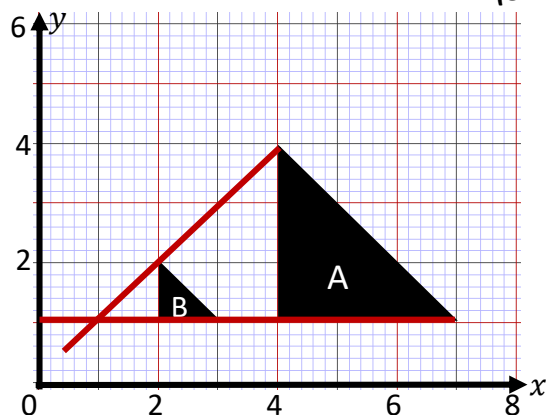
- b) Calculate the value of $gf(4)$ **(2 marks)**

$$f(4) = 4(4) = 16$$

$$gf(4) = g(16) = 5 + 2(16) = 37$$

Answer: 37

- 3) Describe fully the transformation of **A onto B** **(3 marks)**



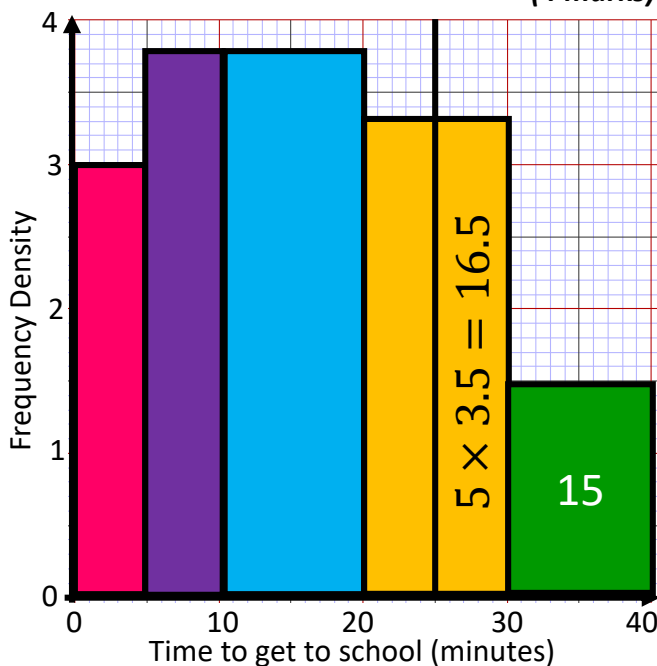
Enlargement, Centre (1,1)

$$\text{Scale factor} = \frac{\text{new}}{\text{old}} = \frac{1}{3}$$

- 4) Elle asks **120 students** how long it took them to travel to school. The results are shown in the table.

Time (t) in mins	Frequency	CW	FD
$0 < t \leq 5$	15	5	3
$5 < t \leq 10$	19	5	3.8
$10 < t \leq 20$	38	10	3.8
$20 < t \leq 30$	33	10	3.3
$30 < t \leq 40$	15	10	1.5

- a) On the grid, draw a **histogram** for the information in the table. **(4 marks)**



- b) How many people did it take **more** than **25 minutes** to get to school? **(2 marks)**

$$16.5 + 15 = 31.5$$

Answer: 32 people

Q	Topic	Σ	R	A	G
1	Compound Interest				
2	Functions				
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