

Answers 21/4/20

Higher Interleaving Quiz

Branch 5

Quizzes 1 to 3



Quiz 1

Q	Topic	Σ	R	A	G
1	Standard Form				
2	Factorise and solve				
3	Transformation				
4	Cumulative Frequency				

Home Study Focus

Home Study Completed

Quiz 2

Q	Topic	Σ	R	A	G
1	Compound Interest				
2	Forming an Equation				
3	Right Angled Trigonometry				
4	Histogram				

Home Study Focus

Home Study Completed

Quiz 3

Q	Topic	Σ	R	A	G
1	Ratio Problem				
2	Iteration				
3	Area Problem				
4	Venn Diagram				

Home Study Focus

Home Study Completed



Higher Interleaving Quiz

Branch 5 Quiz 1

1) $(5 \times 10^a) + (5 \times 10^b) + (5 \times 10^c) = 505.05$

Write down a possible set of values for a, b and c.

S.O.O. $\Rightarrow 5 \times 10^2$ (3 marks)
 S. $\Rightarrow 5 \times 10^0$
 O. $\Rightarrow 5 \times 10^{-2}$

Any order
 a = 2, b = 0, c = -2 (1 mark)

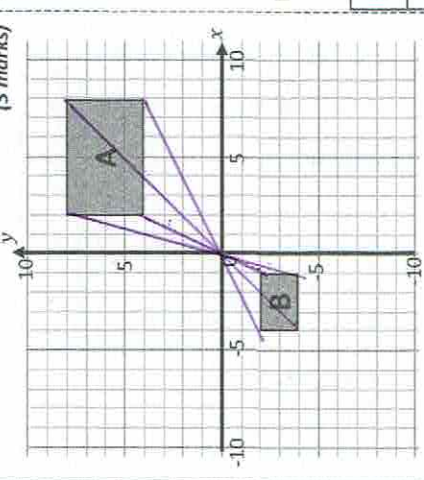
2) a) Factorise $16x^2 - 4$

$4(4x^2 - 1)$
 Answer: $4(2x+1)(2x-1)$

b) Factorise and solve $x^2 - 7x + 6 = 0$ (3 marks)

$(x-1)(x-6) = 0$
 Answer: $x=1$ $x=6$

3) Describe the transformation from A to B. (3 marks)

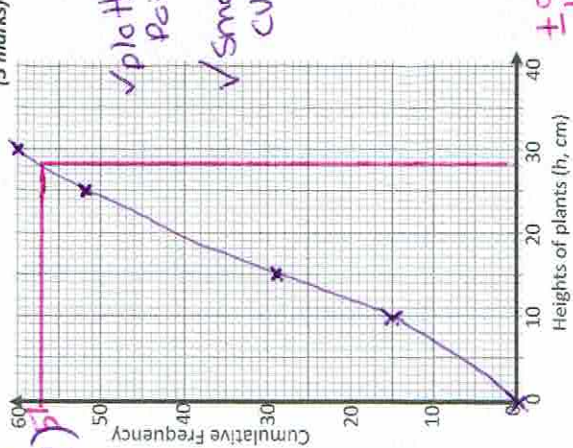


Enlargement ✓
 Centre (0, 0) ✓
 S.F. = $-\frac{\text{New}}{\text{Old}} = -\frac{6}{2} = -3$ ✓

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

Height (h) in cm	Frequency	cf
$0 < h \leq 10$	15	15
$10 < h \leq 15$	14	29
$15 < h \leq 25$	23	52
$25 < h \leq 30$	8	60

a) On the grid, draw a cumulative frequency graph to represent the information. (3 marks)



b) How many plants were more than 28cm tall? (2 marks)

Answer: $60 - 57 = 3$

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Higher Interleaving Quiz

Branch 5 Quiz 2

1) Sahaor invests £124 500 for 2 years at 3.5% per year compound interest. Work out the value of the investment at the end of 2 years.

103.5%
 124500×1.035^2

Answer: £133,367.51

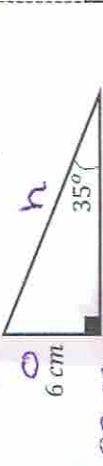
2) The diagram shows a square. (4 marks)



Work out the length of one side.
 $2(x+3) \text{ cm} = 2x + 6$

$6x - 15 = 2x + 6$
 $-2x - 15 = 6$
 $+15 + 15$
 $4x = 21$
 $x = \frac{21}{4} = 5.25$
 one side = 16.5

3) Work out the value of x. Give your answer to 1 decimal place. (2 marks)



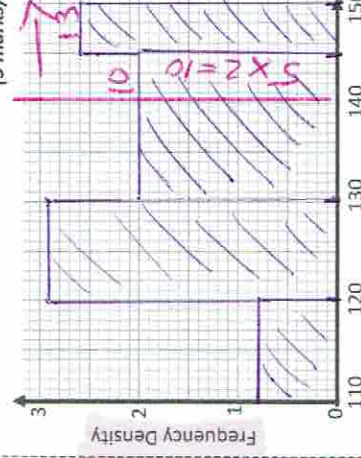
$\sin(35) = \frac{6}{10}$
 $\tan(35) = \frac{6}{x}$
 Answer: $x = \frac{6}{\tan(35)} = 8.57$



4) Anna carried out a survey of the Great North Run times of 80 runners, results are in the table.

time (t) in mins	Frequency	FD
$110 < t \leq 120$	8	10×0.8
$120 < t \leq 130$	29	10×2.9
$130 < t \leq 145$	30	15×2
$145 < t \leq 150$	13	5×2.6

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



b) A reporter states that a quarter of the runners took over 140 minutes to complete the Great North Run. Does Anna's Survey support the statement? Yes No (3 marks)

1/4 of 80 is 20 runners
 $10 + 13 = 23$ runners

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Higher Interleaving Quiz

Branch 5 Quiz 3

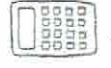
1) Red paint costs £3.20 per litre. Blue paint costs £2.50 per litre. Red and blue paint are mixed together in the ratio of 2:3 to make purple paint.

Work out the cost of 22 litres of purple paint. (4 marks)
 R 4.4 14.4
 B 6.4 4.4 4.4
 22L purple

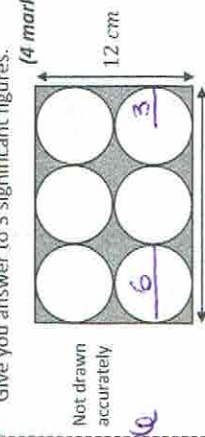
$22 \div 5 = 4.4$
 Red = $2 \times 4.4 = 8.8$
 Cost = $8.8 \times 2.50 = 22.00$
 $= 228.16$
 Blue = $3 \times 4.4 = 13.2$
 Cost = $13.2 \times 2.50 = 33$
 Answer: $228.16 + 33 = 261.16$

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

$x_{n+1} = \frac{x_n^3 - 3}{5}$ and $x_1 = -1$
 Work out the solution to 3 decimal places. (3 marks)
 $x_1 = -1$
 $x_2 = -0.8$
 $x_3 = -0.7024$
 $x_4 = -0.6693$
 $x_5 = -0.6599$
 $x_6 = -0.6574$
 $x_7 = -0.6568$
 Answer: -0.657

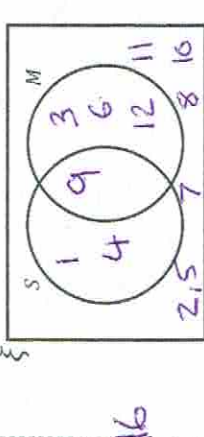


3) Six identical circles just fit inside a rectangle. Work out the area of the shaded section. Give your answer to 3 significant figures. (4 marks)



Not drawn accurately
 $18 \text{ cm} \div 3 = 6$
 Rectangle = $18 \times 12 = 216 \text{ cm}^2$
 Shaded circle = $\pi \times 3^2 = 9\pi$
 Answer: $216 - 3 \times 9\pi = 131.18 \text{ cm}^2$

4) $\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$
 $S =$ square numbers $1, 4, 9$
 $M =$ Multiples of three $3, 6, 9, 12$



a) Complete the Venn diagram. (3 marks)
 b) One number is chosen at random. Write down $P(S \cup M)$ (1 mark)

Answer: $6/12 = 1/2$

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