

Higher Interleaving Quiz

Branch 7

Quizzes 1 to 3



Quiz 1

Q	Topic	Σ	R	A	G
1	Product of Prime Factors				
2	Functions				
3	Right Angled Trigonometry				
4	Cumulative Frequency				

Home Study Focus

Home Study Completed

Quiz 2

Q	Topic	Σ	R	A	G
1	Percentage Problem				
2	Forming and Solving Equations				
3	Area Problem				
4	Averages from a Table				

Home Study Focus

Home Study Completed

Quiz 3

Q	Topic	Σ	R	A	G
1	Recurring Decimal				
2	Regional Inequalities				
3	Volume and Mass				
4	Probability				

Home Study Focus

Home Study Completed



Higher Interleaving Quiz

Branch 7 Quiz 1

1) Express 252 as a product of its prime factors in index form. (3 marks)

252
 2 | 252
 2 | 126
 3 | 63
 3 | 21
 3 | 7
 2 x 2 x 2 x 3 x 3 x 7

Answer: $2^3 \times 3^2 \times 7$

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

$f(x) = x + 4$
 $g(x) = x^2 - 2$

a) Calculate the value of $gf(5)$ (2 marks)

$f(5) = 5 + 4 = 9$

$g(9) = 9^2 - 2 = 81 - 2 = 79$

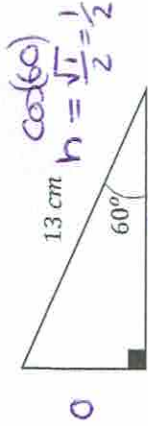
Answer: 79

b) Find $g^{-1}(x)$ (2 marks)

Input $x \rightarrow 5q \rightarrow -2 \rightarrow$ output $g(x)$
 $g^{-1}(x) \leftarrow \sqrt{x} \leftarrow +2 \leftarrow x$

Answer: $g^{-1}(x) = \sqrt{x} + 2$

3) Work out the length of side x . (3 marks)



$\cos(60) = \frac{x}{13}$

$x = 13 \times \cos(60)$

$x = 13 \times \frac{1}{2}$

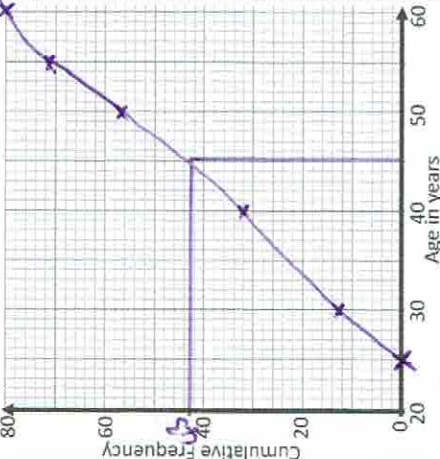
$x = 6.5$

Answer: 6.5

4) This frequency table gives information about the ages of 80 teachers:

Age (A) in years	Frequency	CF
$25 < A \leq 30$	13	13
$30 < A \leq 40$	19	32
$40 < A \leq 50$	25	57
$50 < A \leq 55$	14	71
$55 < A \leq 60$	9	80

a) Draw a cumulative frequency graph to represent this information. (3 marks)



b) Estimate the number of teachers who are older than 45 years. (2 marks)

$80 - 43 = 37$

Answer: 37 ± 2

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Higher Interleaving Quiz

Branch 7 Quiz 2

1) Ollie wants to invest £15,000 into a bank account for 3 years. Which account should he choose? (5 marks)

Account A
Interest:
2.5% per year
compound interest
1.025

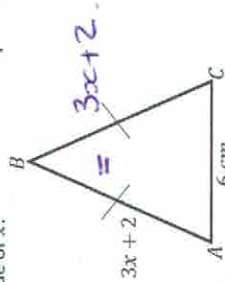
Account B
Interest:
3% for the first year, 1.03
2.5% for the second year
and 1.025
1.5% for the third year. 1.015

A $15000 \times 1.025^3 = 16153.36$

B $15000 \times 1.03 \times 1.025 \times 1.015 = 16073.79$

Answer: Account A

2) In the diagram all measurements are in cm. ABC is an isosceles triangle. The perimeter of the triangle is 55 cm. Find the value of x. (3 marks)



Perimeter = $6x + 10$

$6x + 10 = 55$

$6x = 45$

$x = 7.5$

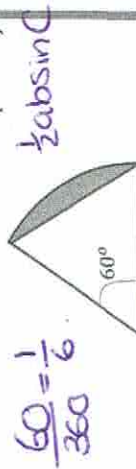
Answer: 7.5



Higher Interleaving Quiz

Branch 7 Quiz 2

3) Find the area of the shaded region. (4 marks)



$\frac{60}{360} \times \pi \times 15^2$

Shaded Sector = $\frac{1}{6} \times \pi \times 15^2$

cut out Triangle = $\frac{1}{2} \times 15 \times 15 \times \sin(60)$

$= 97.4278$

shaded = 20.388 cm^2

Answer: 20.388 cm²

4) Times of both men and women running the London Marathon were recorded. The women's mean time was 4 hours and 30 minutes. 270 mins. The table below shows the men's times. Compare the times that the men and women ran the race in. (3 marks)

Time (t) in mins	Frequency	MP	Fx
$220 < t \leq 260$	27	260	6480
$260 < t \leq 280$	32	270	8640
$280 < t \leq 300$	24	290	6960
$300 < t \leq 330$	17	315	5255
	100	274.35	27435

Men's mean $274.35 - 100 = 274.35$ mins
women's mean 270 mins
Men took longer on average by just over 4 minutes.

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Higher Interleaving Quiz

Branch 7 Quiz 3

1) Express 0.15 as a fraction in its simplest form. (3 marks)

let $x = 0.15151515 \dots$
 $100x = 15.151515 \dots$

$99x = 15$

$x = \frac{15}{99}$

$= \frac{5}{33}$

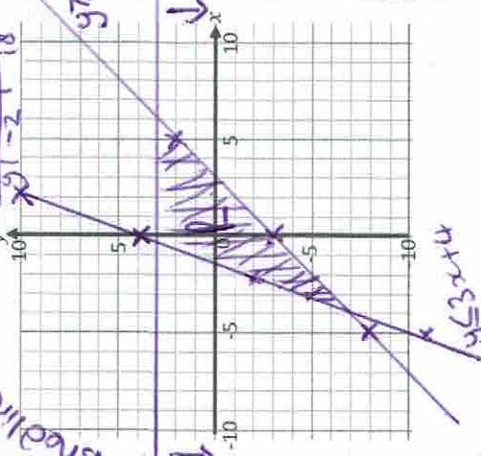
Answer: 5/33

2) The region R satisfies the inequalities $y \geq x - 3$ and $y < 3$. On the grid below, draw straight lines and use shading to show the region R. (4 marks)

$y \leq 3x + 4$

On the grid below, draw straight lines and use shading to show the region R. (4 marks)

$x = \frac{10}{-5} \mid \frac{0}{5}$
 $y = \frac{-8}{3} \mid \frac{2}{2}$
 $x = -2 \mid -2$
 $y = -2 \mid 2$



Higher Interleaving Quiz

Branch 7 Quiz 3

3) The diagram shows a solid cylinder. (5 marks)

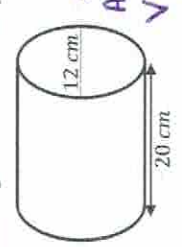


Diagram NOT accurately drawn
 $r = 12 \text{ cm}$
 $A = \pi r^2 = 36\pi$
 $V = 36\pi \times 20 = 720\pi$

The cylinder is made from titanium. The density of titanium is $4.4 \text{ g/cm}^3 = 2261.95 \text{ cm}^3$. Calculate the mass of the cylinder.

Mass = $720\pi \times 4.4 = 9952.57 \text{ g}$

Answer: 9952.57g

4) Here is a spinner.



a) Abdul is going to spin the spinner 5 times. He says, "I will get one of each number." Give a reason why he could be wrong. (1 mark)

because each spin is independent of the last.

Answer: because each spin is independent of the last.

b) Siraj spins the spinner 40 times. His results are shown in the table below. (2 marks)

Number Spun	1	2	3	4	5
Frequency	10	6	4	8	12

Work out the relative frequency of spinning an even number. $6+8=14$

Answer: $\frac{14}{40} = \frac{7}{20}$

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