



Year 10 Summer Work

Topic	Completed
Factorising quadratics	
Expanding three brackets	
Recurring decimals	
Probability trees	
Surds	
Upper and lower bounds	
Equations of lines	
Proportion	
Indices	
Trigonometry	

Higher

Q1.

Factorise $3x^2 + 14x + 8$

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Answer

(Total 2 marks)

Q2. Simplify

$$\frac{4x^2 - 1}{4x^2 + 12x + 5}$$

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Answer

(Total 3 marks)

Q3.

Expand and simplify $(t + 4)^3$

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Answer.....

(Total 3 marks)

Q4.

Convert $0.1\dot{7}\dot{2}$ to a fraction in its lowest terms.

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Answer

(Total 3 marks)

Q5.

(a) Show that $\frac{4}{9}$ is equivalent to $0.\dot{4}$

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(1)

(b) Using part (a), or otherwise, write $0.9\dot{4}$ as a fraction.

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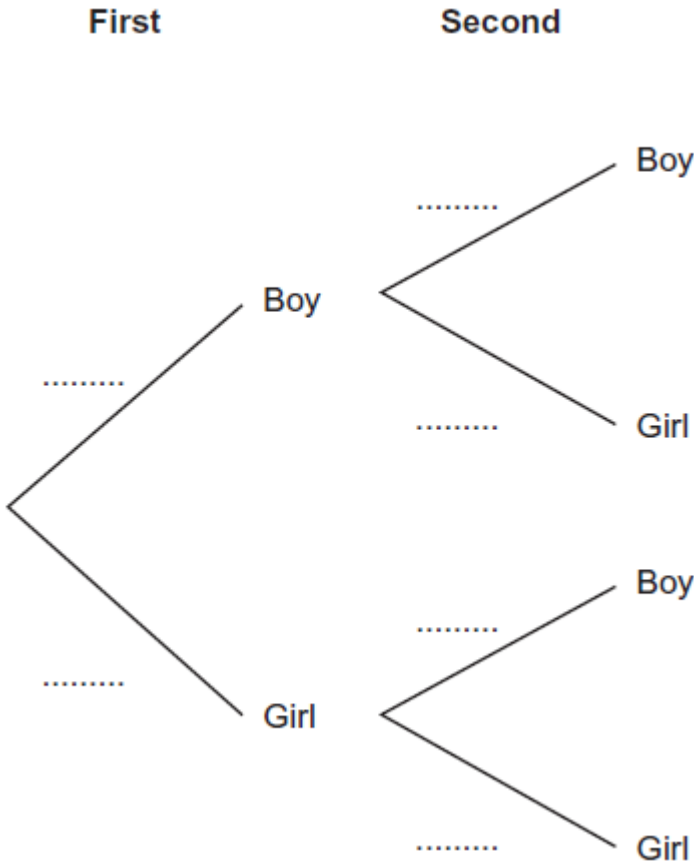
Answer

(2)

(Total 3 marks)

Q6.A team has 7 boys and 3 girls.
 Stevie chooses two of the team at random.

(a) Complete the probability tree diagram.



(3)

(b) Work out the probability that he chooses one boy and one girl.

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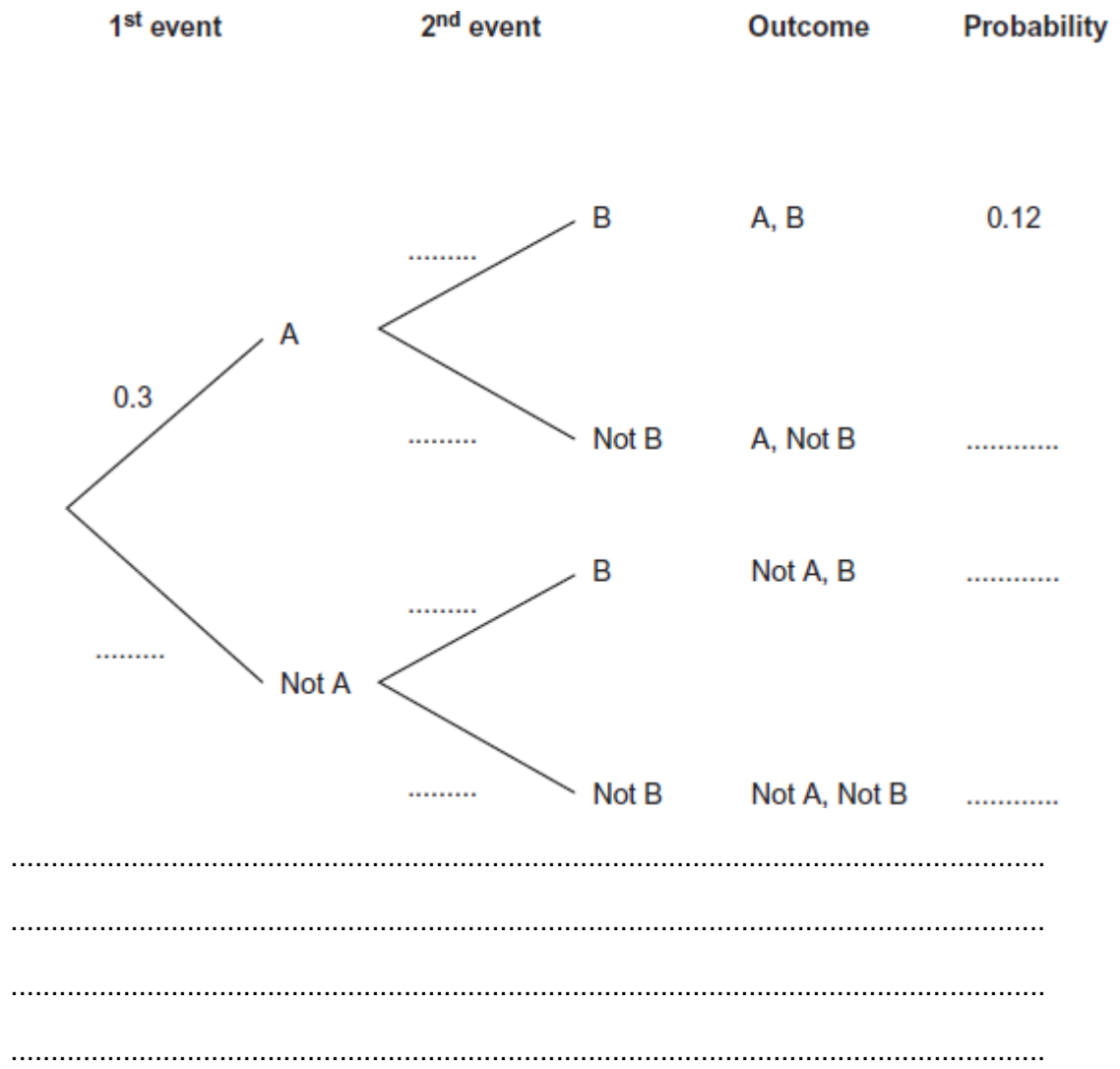
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Answer

(3)
 (Total 6 marks)

Q7.A and B are independent events.

Fill in **all** eight missing probabilities in the diagram below.



(Total 4 marks)

Q8.(a) Rationalise the denominator and simplify $\frac{16}{\sqrt{2}}$

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Answer

(2)

(b) Expand and simplify $(5 - \sqrt{3})^2$

Give your answer in the form $a - b\sqrt{3}$

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Answer

(2)

(Total 4 marks)

Q9.(a) Circle the value that is equivalent to $\sqrt{50} + \sqrt{32}$

$9\sqrt{2}$ 41 $\sqrt{82}$ $2\sqrt{41}$

(1)

(b) Circle the value that is equivalent to $4\sqrt{75} \div 2\sqrt{3}$

$2\sqrt{72}$ 10 $2\sqrt{15}$ 20

(1)
(Total 2 marks)

Q10. $\sqrt{10}(3\sqrt{20} + 7\sqrt{5})$ simplifies to $a\sqrt{2}$

Work out the value of a

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Answer

(Total 3 marks)

Q11. Write $\frac{6}{\sqrt{3}} + \sqrt{75}$ in the form $a\sqrt{3}$, where a is an integer.

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Answer

(Total 4 marks)

Q12.

$x = 400$ to 1 significant figure.

$y = 25$ to 2 significant figures.

Work out the maximum **integer** value of $\frac{x}{y}$

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Answer

(Total 3 marks)

Q13. Bags of nails weigh 200 grams each.

Boxes of screws weigh 140 grams each.

Both measurements are given to the nearest 10 grams.

Show that 4 bags of nails **could** weigh the same as 6 boxes of screws.

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(Total 3 marks)

Q14.(a) Line M has the equation $3x + 2y = 7$

Circle the gradient of line M .

- -3 $-\frac{3}{2}$ 3 $\frac{3}{2}$

(1)

(b) Line N has the equation $y = 5 - \frac{3}{4}x$

Circle the gradient of a line that is **perpendicular** to line N .

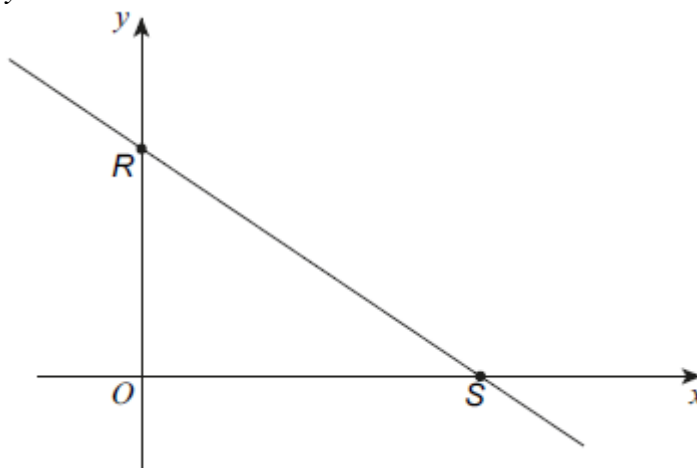
- $-\frac{4}{3}$ $\frac{3}{4}$ $\frac{4}{3}$ 3

(1)

(Total 2 marks)

Q15.

A sketch of $2x + 3y = 12$ is shown.



(a) Work out the coordinates of R .

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Answer (.....,))

(1)

(b) Work out the coordinates of RS .

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Answer (.....,))

(2)

(Total 3 marks)

Q16.

y is directly proportional to \sqrt{x}

x	36	a
y	2	5

Work out the value of a .

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Answer

(Total 4 marks)

Q17. y is inversely proportional to x .

When $y = 2$, $x = 5$

Work out an equation connecting y and x .

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Answer

(Total 3 marks)

Q18.(a) Circle the value of the reciprocal of 0.2

- $\frac{2}{10}$ $\frac{1}{2}$ $\frac{1}{20}$ 0.8 5

(1)

(b) Circle the value of 8.5^0

- 0 1 8.1 8.5

(1)

(c) Work out $27^{\frac{1}{3}} \times 7^{-2}$

Give your answer as a fraction.

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Answer

(3)
(Total 5 marks)

Q19.(a) Circle the value of 3^{-2}

-6 $\frac{1}{6}$ $\frac{1}{9}$ -9

(1)

(b) Work out the value of $(-8)^0 + 8^{-\frac{2}{3}}$

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Answer

(3)
(Total 4 marks)

Q20. Put these in order starting with the smallest.
You **must** show the value of each number in your working.

$9^{\frac{1}{2}}$ $(-7)^0$ $\left(\frac{1}{8}\right)^{-\frac{1}{3}}$

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Smallest.....

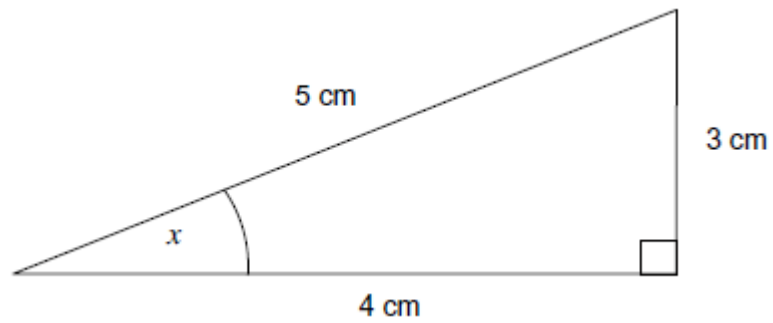
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Largest.....

(Total 4 marks)

Q21.(a)

Not drawn accurately



Circle the value of $\sin x$.

$\frac{3}{5}$

$\frac{3}{4}$

$\frac{4}{5}$

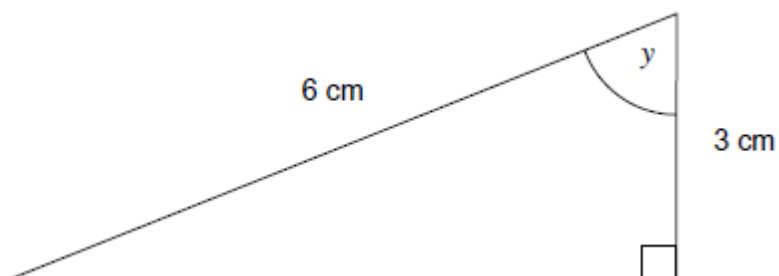
$\frac{4}{3}$

$\frac{5}{3}$

(1)

(b)

Not drawn accurately



Circle the size of angle y .

30°

36°

45°

50°

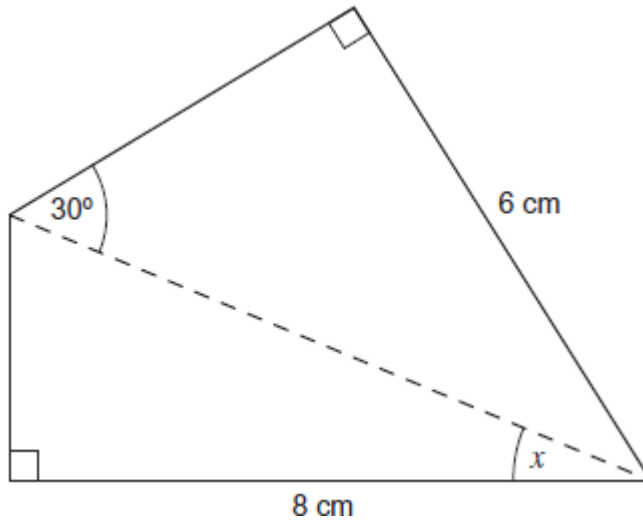
60°

(1)
(Total 2 marks)

Q22.

The diagram shows a quadrilateral.

Not drawn accurately



Work out the size of angle x .

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Answer degrees

(Total 4 marks)