

Questions

Q1.

Show that $(6 - \sqrt{8})^2 = 44 - 24\sqrt{2}$

Show each stage of your working clearly.

(Total for question = 3 marks)

Q2.

Show that $\frac{\sqrt{3} + \sqrt{27}}{\sqrt{2}}$ can be expressed in the form \sqrt{k} where k is an integer.

State the value of k .

$k = \dots\dots\dots$

(Total for question is 3 marks)

Q3.

Express $\sqrt{48} + \sqrt{108}$ in the form $k\sqrt{6}$ is a surd

$\dots\dots\dots$

(Total for question = 3 marks)

Q4.

(a) Show that $(3 + 2\sqrt{2})(4 - \sqrt{2}) = 8 + 5\sqrt{2}$

Show your working clearly.

(2)

(b) Rationalise the denominator and simplify fully

$$\frac{10 + 3\sqrt{2}}{\sqrt{2}}$$

Show your working clearly.

.....

(2)

(Total for question = 4 marks)

Q5.

$(3 + \sqrt{a})(4 + \sqrt{a}) = 17 + k\sqrt{a}$ where a and k are positive integers.

Find the value of a and the value of k .

$a =$

$k =$

(Total for question = 3 marks)

Q6.

(a) Expand $(5 + 3\sqrt{2})^2$

Give your answer in the form $(a + b\sqrt{2})$, where a and b are integers.

Show your working clearly.

.....

(2)

(b) $(5 + 3\sqrt{2})^2 = p + \frac{q}{\sqrt{8}}$, where p and q are integers.

Find the value of q .

$q =$

(3)

(Total for Question is 5 marks)

Q7.

(a) Show that $(5 - \sqrt{8})(7 + \sqrt{2}) = 31 - 9\sqrt{2}$

Show each stage of your working.

(3)

Given that c is a prime number,

(b) rationalise the denominator of $\frac{3c - \sqrt{c}}{\sqrt{c}}$

Simplify your answer.

.....

(2)

(Total for question = 5 marks)

Q8.

Given that $(5 - \sqrt{x})^2 = y - 20\sqrt{2}$ where x and y are positive integers, find the value of x and the value of y .

$x =$

$y =$

(Total for Question is 3 marks)

Q9.

Given that x and y are positive integers such that $(1 + \sqrt{x})(3 + \sqrt{x}) = y + 4\sqrt{5}$ find the value of x and the value of y .

$x =$

$y =$

(Total for Question is 3 marks)

Q10.

$$(\sqrt{a} + \sqrt{8a})^2 = 54 + b\sqrt{2}$$

a and b are positive integers.
Find the value of a and the value of b .
Show your working clearly.

$a =$

$b =$

(Total for question = 3 marks)

Q11.

A trapezium $ABCD$ has an area of $5\sqrt{6} \text{ cm}^2$.

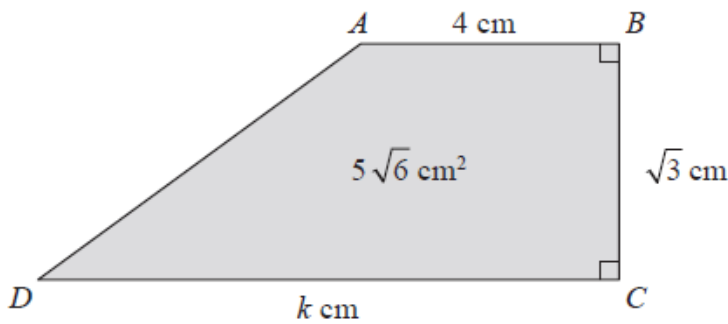


Diagram NOT
accurately drawn

$AB = 4 \text{ cm}$.
 $BC = \sqrt{3} \text{ cm}$.
 $DC = k \text{ cm}$.

Calculate the value of k , giving your answer in the form $a\sqrt{b} - c$
where a , b and c are positive integers.
Show each step in your working.

$k =$

(Total for Question is 3 marks)

Q12.

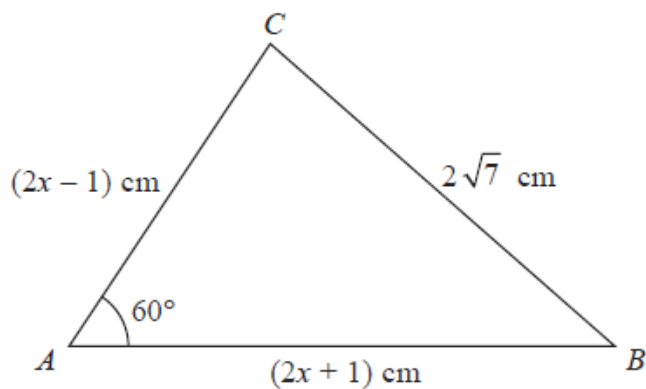


Diagram **NOT**
accurately drawn

The diagram shows a triangle ABC .

$AB = (2x + 1)$ cm, $AC = (2x - 1)$ cm and $BC = 2\sqrt{7}$ cm.

Angle $BAC = 60^\circ$

Work out the value of x .

Show clear algebraic working.

$x = \dots\dots\dots$

(Total for question = 3 marks)