

1.**[2 marks]**

Express $\sqrt{98}$ in the form $a\sqrt{b}$ where a and b are integers and $a > 1$.

.....

2.**[3 marks]**

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

.....

3.**[2 marks]**

Show that $\sqrt{27} + \sqrt{147}$ can be expressed in the form $a\sqrt{b}$, where a and b are integers.

.....

(2)

Simplify $(7 + 2\sqrt{50})(5 - 2\sqrt{2})$

Give your answer in the form $a + b\sqrt{18}$ where a and b are integers.
Show your working clearly.

.....

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

Show each stage of your working clearly.



(a) Show that $\sqrt{48} + \sqrt{108}$ can be expressed in the form $a\sqrt{b}$, where a and b are integers.

.....
(2)

(b) Show that $(5 - \sqrt{12})(6 - \sqrt{3}) = 36 - 17\sqrt{3}$
Show each stage of your working.

.....
(2)

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 .

$k =$



(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)

Show that $\frac{12}{\sqrt{8}} = 3\sqrt{2}$



(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)



11.**[3 marks]**

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 .

 $x = \dots\dots\dots$ $y = \dots\dots\dots$ **12.****[3 marks]**

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

Find the value of a and the value of k .

 $a = \dots\dots\dots$ $k = \dots\dots\dots$ 

A trapezium $ABCD$ has an area of $5\sqrt{6}$ cm².

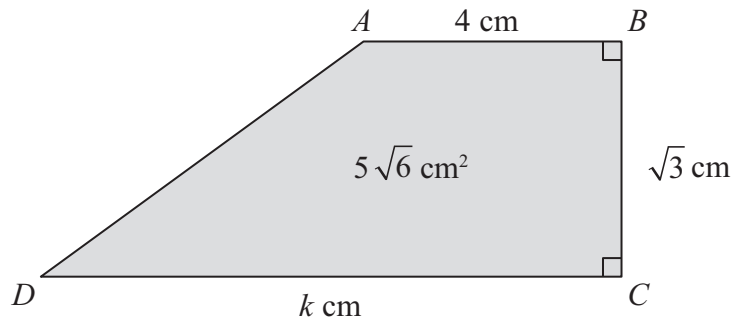


Diagram **NOT**
accurately drawn

$$AB = 4 \text{ cm.}$$

$$BC = \sqrt{3} \text{ cm.}$$

$$DC = k \text{ cm.}$$

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.

$$k = \dots\dots\dots$$



(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)



15.**[3 marks]**

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

a and b are positive integers.

Find the value of a and the value of b .

Show your working clearly.

$a = \dots\dots\dots$

$b = \dots\dots\dots$

16.**[3 marks]**

$$(a + \sqrt{b})^2 = 49 + 12\sqrt{b} \quad \text{where } a \text{ and } b \text{ are integers, and } b \text{ is prime.}$$

Find the value of a and the value of b

$a = \dots\dots\dots$

$b = \dots\dots\dots$

17.**[3 marks]**

Simplify fully $\frac{(6 - \sqrt{5})(6 + \sqrt{5})}{\sqrt{31}}$

You must show your working.

.....



Express $\frac{\sqrt{18+10}}{\sqrt{2}}$ in the form $p+q\sqrt{2}$, where p and q are integers.

Show clear working out.

.....
(3)

Rationalise the denominator and simplify fully $\frac{33}{4+\sqrt{5}}$

Show clear working out.

.....
(4)



20.**[4 marks]**

Express $\frac{39}{4-\sqrt{3}}$ in the form $a+b\sqrt{3}$, where a and b are integers

Show clear working out.

.....
(4)

21.**[4 marks]**

Simplify $\frac{7-\sqrt{5}}{2+\sqrt{5}}$, giving your answer in the form $a+b\sqrt{5}$, where a and b are integers.

Show clear working out.

.....
(4)



Show that $\frac{3}{\sqrt{27}-\sqrt{18}}$ can be written in the form $\sqrt{m} + \sqrt{n}$, where m and n are integers.

.....
(4)

Show that $\frac{16}{\sqrt{2}} - \sqrt{8} = 6\sqrt{2}$

(4)

