Topic Test 1 (20 minutes)

Surds (non-calculator) - Higher

1 (a) Simplify $\left(\sqrt{15}\right)^4$

[1 mark]

Answer _____

1 (b) Simplify $\frac{\sqrt{96}}{\sqrt{8}}$

Give your answer in the form $a\sqrt{3}$, where a is an integer.

[2 marks]

Answer _____

1 (c) Simplify $\sqrt{18} \times \sqrt{50}$

[1 mark]

Answer _____

2 Circle the value that is equivalent to $\sqrt{20} + \sqrt{45}$

[1 mark]

$5\sqrt{15}$ $13\sqrt{5}$ $5\sqrt{5}$ $\sqrt{65}$

3 Circle the value that is equivalent to $6\sqrt{15} \div 3\sqrt{5}$

[1 mark]

$2\sqrt{3}$ $3\sqrt{3}$ $3\sqrt{5}$ $3\sqrt{10}$

4 Show that $\left(\sqrt{3} + \sqrt{27}\right)^2$ can be written as a integer.

[2 marks]

5 Rationalise the denominator and simply $\frac{24}{\sqrt{6}}$

[2 marks]

Answer _____

6 Here are the first 4 terms of a geometric progression

$\sqrt{r}$ $\quad$ r $\quad$ $r\sqrt{r}$ $\quad$ r^2

6 (a) Work out the 10th term.
Give your answer in terms of r.

[1 mark]

Answer _____

6 (b) When $r = 8$, work out the sum of the first 4 terms.
Give your answer in the form $a(b + \sqrt{2})$, where a and b are integers.

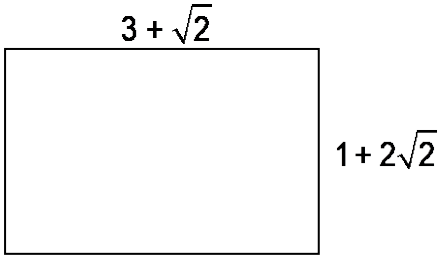
[3 marks]

Answer _____

7 All lengths are in centimetres.

Work out the area of this rectangle.
Give your answer in the form $a + b\sqrt{2}$, where a and b are integers.

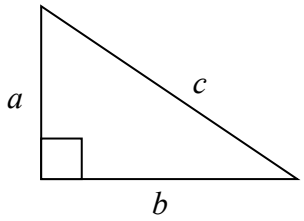
[2 marks]



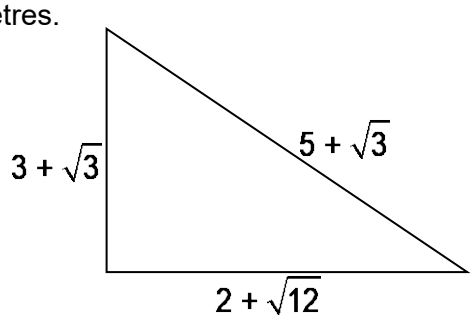
Answer _____ cm^2

8 For a right-angled triangle with sides a, b and c, Pythagoras' theorem states that

$$a^2 + b^2 = c^2$$



Is this triangle right-angled?
All lengths are in centimetres.



[4 marks]