Surds Past Paper Questions Edexcel Maths IGCSE Higher- Calculator

1.

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.

$k =$ .....

(Total for Question 1 is 3 marks)

2.

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)

3.

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 1 is 3 marks)

4.

Given that p is a prime number, rationalise the denominator of $\dfrac{7\sqrt{p} - p^2}{\sqrt{p^3}}$

Simplify your answer.

(Total for Question is 3 marks)

5.

(a) $\sqrt{50} + \sqrt{128} - \sqrt{200} = n\sqrt{2}$ where n is an integer.

Find the value of n.
Show each stage of your working.

$n =$ .....

(2)

Given that a is a prime number,

(b) simplify $\dfrac{5\sqrt{a} + a}{10\sqrt{a}}$

Give your answer in the form $x + y\sqrt{a}$, where x and y are fractions.
Show your working clearly.

.....

(2)

6.

Show that $\frac{\sqrt{8}}{\sqrt{8}-2}$ can be written in the form $n+\sqrt{n}$, where n is an integer.
Show your working clearly.

(Total for Question is 3 marks)

7.

(a) Rationalise the denominator of $\frac{a+\sqrt{4b}}{a-\sqrt{4b}}$ where a is an integer and b is a prime number.

Simplify your answer.

(3)

8.

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

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 8 is 3 marks)

9.

(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)

10.

$$\left(5\sqrt{2} - e\right)\left(3\sqrt{2} + e\right) = f\sqrt{2} - 6$$

Given that e and f are positive integers,

find the value of e and the value of f.

$e =$ .....

$f =$ .....

(Total for Question is 3 marks)