



Scan for the solutions

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1 Find the exact value of

a. $32^{\frac{3}{5}}$

b. $(\frac{16}{81})^{-\frac{3}{4}}$

(3 marks)

Answer _____

2 Write $\sqrt{75} + \sqrt{48} - \sqrt{12}$ in the form $k\sqrt{3}$, where k is an integer.

(2 marks)

Answer _____

3 Simplify fully $(9x^4)^{\frac{1}{2}} \times 2x^{-3}$

(2 marks)

Answer _____

4 Write $\frac{12}{3 - \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers.

(3 marks)

Answer _____

5 Write $\frac{5 + 2\sqrt{3}}{2 + \sqrt{3}}$ in the form $p + q\sqrt{3}$, where p and q are integers.

You must show all stages of your working.

(3 marks)

Answer _____

6

a. Write 8^{x+1} in the form 2^{ax+b} , where a and b are integers.

b. Hence solve the equation $8^{x+1} = 4^{2x-3}$

(4 marks)

Answer _____

7

Write $8x^3 - 3\sqrt{x}$ in the form $ax^p + bx^q$, where a , b , p and q are constants.

(3 marks)

Answer _____

8

Given that $y = 3^x$,

a. write 9^x in terms of y ,

b. write 3^{x+1} in terms of y .

c. Hence solve the equation $9^x - 4 \times 3^{x+1} + 27 = 0$

(5 marks)

Answer _____

9

Solve the equation

$$\sqrt{5}x = \sqrt{3}(x+2)$$

giving your answer in the form $a + \sqrt{b}$, where a and b are integers.

(4 marks)

Answer _____

10 Given that

$$2^x \times 4^y = \frac{1}{8} \quad \text{and} \quad \frac{27^x}{9^y} = 2187$$

find the value of x and the value of y .

(5 marks)

Answer _____

11 A rectangular tile has area 14 cm^2 . Its width is $(4 - \sqrt{2}) \text{ cm}$.

a. Find the length of the tile, giving your answer in the form $(a + b\sqrt{2}) \text{ cm}$, where a and b are integers.

b. Show that the diagonal of the tile is exactly 6 cm.

(6 marks)

Answer _____

12 a. Show that, for any positive integer n ,

$$\frac{1}{\sqrt{n} + \sqrt{n+1}} = \sqrt{n+1} - \sqrt{n}$$

b. Hence find the exact value of

$$\frac{1}{1 + \sqrt{2}} + \frac{1}{\sqrt{2} + \sqrt{3}} + \frac{1}{\sqrt{3} + \sqrt{4}} + \dots + \frac{1}{\sqrt{24} + \sqrt{25}}$$

(5 marks)

Answer _____

End of questions | Total 45 marks