N61 Surds Expanding Brackets

OCR

Edexcel

19 $\dfrac{1 + \sqrt{2}}{(3 - \sqrt{2})^2}$ can be written in the form $a + b\sqrt{2}$

Find the value of a and the value of b.

$a =$ ....

$b =$ ....

(Total for Question 19 is 5 marks)

19 $\dfrac{1 + \sqrt{2}}{(3 - \sqrt{2})^2}$ can be written in the form $a + b\sqrt{2}$

Find the value of a and the value of b.

$\left(3 - \sqrt{2}\right)\left(3 - \sqrt{2}\right)$

$9 - 3\sqrt{2} - 3\sqrt{2} + 2$

$11 - 6\sqrt{2}$

$\left(1 + \sqrt{2}\right)\left(11 + 6\sqrt{2}\right)$

$11 + 6\sqrt{2} + 11\sqrt{2} + 6(2)$

$23 + 17\sqrt{2}$

$\dfrac{1 + \sqrt{2}}{11 - 6\sqrt{2}} \times \dfrac{11 + 6\sqrt{2}}{11 + 6\sqrt{2}}$

$\dfrac{23 + 17\sqrt{2}}{49}$

$\left(11 - 6\sqrt{2}\right)\left(11 + 6\sqrt{2}\right)$

$121 + \cancel{66\sqrt{2}} \cancel{-66\sqrt{2}}$

$-36(2)$

$121 - 72$
$= 49$

$a = \dfrac{23}{49}$

$b = \dfrac{17}{49}$

(Total for Question 19 is 5 marks)

21 Show that $\dfrac{6 - \sqrt{8}}{\sqrt{2} - 1}$ can be written in the form $a + b\sqrt{2}$ where a and b are integers.

(Total for Question 21 is 3 marks)

21 Show that $\dfrac{6 - \sqrt{8}}{\sqrt{2} - 1}$ can be written in the form $a + b\sqrt{2}$ where a and b are integers.

$$\frac{6 - \sqrt{8}}{\sqrt{2} - 1} \times \frac{\sqrt{2} + 1}{\sqrt{2} + 1}$$

$$(\sqrt{2} - 1)(\sqrt{2} + 1)$$

$$2 + \sqrt{2} - \sqrt{2} - 1$$

$$2 - 1 = 1$$

ans

$$\frac{4\sqrt{2} + 2}{1}$$

$$(6 - \sqrt{8})(\sqrt{2} + 1)$$

$$6\sqrt{2} + 6 - \sqrt{16} - \sqrt{8}$$

$$6\sqrt{2} + 6 - 4 - 2\sqrt{2}$$

$$= 4\sqrt{2} + 2$$

$$\sqrt{8} = \sqrt{4}\sqrt{2} = 2\sqrt{2}$$

$$= 4\sqrt{2} + 2$$

$$= 2 + 4\sqrt{2} \checkmark$$

(Total for Question 21 is 3 marks)

13 $\sqrt{5}(\sqrt{8} + \sqrt{18})$ can be written in the form $a\sqrt{10}$ where a is an integer.

Find the value of a.

N60/61

$a = $ ....

(Total for Question 13 is 3 marks)

13 $\sqrt{5}(\sqrt{8} + \sqrt{18})$ can be written in the form $a\sqrt{10}$ where a is an integer.

Find the value of a.

N60/61

$$\sqrt{5}\left(\sqrt{8} + \sqrt{18}\right)$$

$$\sqrt{40} + \sqrt{90}$$

$$\sqrt{4}\sqrt{10} + \sqrt{9}\sqrt{10}$$

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

$a = $ 5

(Total for Question 13 is 3 marks)

AQA

29 Work out the value of $\left(\sqrt{3}\right)^2 \times \left(\sqrt{2}\right)^2$

N61

[2 marks]

_____

_____

_____

Answer _____

29 Work out the value of $\left(\sqrt{3}\right)^2 \times \left(\sqrt{2}\right)^2$

[2 marks]

N61

$$\sqrt{3} \times \sqrt{3} = 3$$

$$\sqrt{2} \times \sqrt{2} = 2$$

$$3 \times 2$$

Answer $= 6$