



Rationalisation Ex 3.1 Q3

Answer :

(i) We know that $(a+b)(a-b) = a^2 - b^2$. We will use this property to simplify the expression

$$\begin{aligned} & (11 + \sqrt{11})(11 - \sqrt{11}) \\ \therefore & (11 + \sqrt{11})(11 - \sqrt{11}) = 11^2 - (\sqrt{11})^2 \\ & = 11 \times 11 - \sqrt{11} \times \sqrt{11} \\ & = 121 - \sqrt{11 \times 11} \\ & = 121 - (11^2)^{\frac{1}{2}} \\ & = 121 - 11 \\ & = 110 \end{aligned}$$

Hence the value of expression is 110.

(ii) We know that $(a+b)(a-b) = a^2 - b^2$. We will use this property to simplify the expression

$$\begin{aligned} & (5 + \sqrt{7})(5 - \sqrt{7}) \\ \therefore & (5 + \sqrt{7})(5 - \sqrt{7}) = 5^2 - (\sqrt{7})^2 \\ & = 5 \times 5 - \sqrt{7} \times \sqrt{7} \\ & = 25 - \sqrt{7 \times 7} \\ & = 25 - (7^2)^{\frac{1}{2}} \\ & = 25 - 7^1 \\ & = 18 \end{aligned}$$

Hence the value of expression is 18.

(iii) We know that $(a-b)(a+b) = a^2 - b^2$. We will use this property to simplify the expression

$$\begin{aligned} & (\sqrt{8} - \sqrt{2})(\sqrt{8} + \sqrt{2}) \\ \therefore & (\sqrt{8} - \sqrt{2})(\sqrt{8} + \sqrt{2}) = (\sqrt{8})^2 - (\sqrt{2})^2 \\ & = \sqrt{8} \times \sqrt{8} - \sqrt{2} \times \sqrt{2} \\ & = \sqrt{8 \times 8} - \sqrt{2 \times 2} \\ & = (8^2)^{\frac{1}{2}} - (2^2)^{\frac{1}{2}} \\ & = 8^1 - 2^1 \\ & = 6 \end{aligned}$$

Hence the value of expression is 6

Hence the value of expression is 6

(iv) We know that $(a+b)(a-b) = a^2 - b^2$. We will use this property to simplify the expression

$$\begin{aligned} & (3 + \sqrt{3})(3 - \sqrt{3}) \\ \therefore & (3 + \sqrt{3})(3 - \sqrt{3}) = (3)^2 - (\sqrt{3})^2 \\ & = 3^2 - \sqrt{3} \times \sqrt{3} \\ & = 3 \times 3 - \sqrt{3 \times 3} \\ & = 9 - (3^2)^{\frac{1}{2}} \\ & = 9 - 3^1 \\ & = 6 \end{aligned}$$

Hence the value of expression is 6.

(v) We know that $(a-b)(a+b) = a^2 - b^2$. We will use this property to simplify the expression

$$(\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2}).$$

$$\therefore (\sqrt{5} - \sqrt{2})(\sqrt{5} + \sqrt{2}) = (\sqrt{5})^2 - (\sqrt{2})^2$$

$$= \sqrt{5} \times \sqrt{5} - \sqrt{2} \times \sqrt{2}$$

$$= (5^{\frac{1}{2}})^{\frac{1}{2}} - (2^{\frac{1}{2}})^{\frac{1}{2}}$$

$$= 5^1 - 2^1$$

$$= 3$$

Hence the value of expression is 3.

***** END *****