



### Rationalisation Ex 3.2 Q9

**Answer :**

We know that rationalization factor for  $\sqrt{5}-\sqrt{3}$  is  $\sqrt{5}+\sqrt{3}$ . We will multiply denominator and numerator of the given expression  $\frac{6}{\sqrt{5}-\sqrt{3}}$  by  $\sqrt{5}+\sqrt{3}$ , to get

$$\begin{aligned}\frac{6}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} &= \frac{6\sqrt{5}+6\sqrt{3}}{(\sqrt{5})^2-(\sqrt{3})^2} \\ &= \frac{6\sqrt{5}+6\sqrt{3}}{5-3} \\ &= \frac{6\sqrt{5}+6\sqrt{3}}{2} \\ &= 3\sqrt{5}+3\sqrt{3}\end{aligned}$$

Putting the values of  $\sqrt{5}$  and  $\sqrt{3}$ , we get

$$\begin{aligned}3\sqrt{5}+3\sqrt{3} &= 3(2.236)+3(1.732) \\ &= 6.708+5.196 \\ &= 11.904\end{aligned}$$

Hence value of the given expression is  $\boxed{11.904}$ .

### Rationalisation Ex 3.2 Q10

**Answer :**

(i) We know that rationalization factor for  $3+2\sqrt{5}$  is  $3-2\sqrt{5}$ . We will multiply numerator and denominator of the given expression  $\frac{3-\sqrt{5}}{3+2\sqrt{5}}$  by  $3-2\sqrt{5}$ , to get

$$\begin{aligned}\frac{3-\sqrt{5}}{3+2\sqrt{5}} \times \frac{3-2\sqrt{5}}{3-2\sqrt{5}} &= \frac{(3)^2-3 \times 2 \times \sqrt{5}-3 \times \sqrt{5}+2 \times (\sqrt{5})^2}{(3)^2-(2\sqrt{5})^2} \\ &= \frac{9-9\sqrt{5}+10}{9-20} \\ &= \frac{19-9\sqrt{5}}{-11} \\ &= \frac{9\sqrt{5}-19}{11}\end{aligned}$$

Putting the values of  $\sqrt{5}$ , we get

$$\begin{aligned}\frac{9\sqrt{5}-19}{11} &= \frac{9(2.236)-19}{11} \\ &= \frac{20.124-19}{11} \\ &= \frac{1.124}{11} \\ &= 0.102\end{aligned}$$

Hence the given expression is simplified to  $\boxed{0.102}$ .

(ii) We know that rationalization factor for  $3-2\sqrt{2}$  is  $3+2\sqrt{2}$ . We will multiply numerator and denominator of the given expression  $\frac{1+\sqrt{2}}{3-2\sqrt{2}}$  by  $3+2\sqrt{2}$ , to get

$$\begin{aligned}\frac{1+\sqrt{2}}{3-2\sqrt{2}} \times \frac{3+2\sqrt{2}}{3+2\sqrt{2}} &= \frac{3+2\times\sqrt{2}+3\times\sqrt{2}+2\times(\sqrt{2})^2}{(3)^2-(2\sqrt{2})^2} \\ &= \frac{3+2\sqrt{2}+3\sqrt{2}+4}{9-8} \\ &= \frac{7+5\sqrt{2}}{1} \\ &= 7+5\sqrt{2}\end{aligned}$$

Putting the value of  $\sqrt{2}$ , we get

$$\begin{aligned}7+5\sqrt{2} &= 7+5(1.4142) \\ &= 7+7.071 \\ &= 14.071\end{aligned}$$

Hence the given expression is simplified to  $\boxed{14.071}$ .

### Rationalisation Ex 3.2 Q11

**Answer :**

$$\text{We have, } x = \frac{\sqrt{3}+1}{2}$$

It can be simplified as

$$2x-1 = \sqrt{3}$$

On squaring both sides, we get

$$\begin{aligned}(2x-1)^2 &= (\sqrt{3})^2 \\ (2x)^2 + 1 - 2 \times 2x &= 3 \\ 4x^2 + 1 - 4x &= 3 \\ 4x^2 - 4x - 2 &= 0\end{aligned}$$

The given equation can be rewritten as.  $4x^3 + 2x^2 - 8x + 7 = x(4x^2 - 4x - 2) + \frac{6}{4}(4x^2 - 4x - 2) + 3 + 7$

Therefore, we have

$$\begin{aligned}4x^3 + 2x^2 - 8x + 7 &= x(0) + \frac{6}{4}(0) + 3 + 7 \\ &= 3 + 7 \\ &= 10\end{aligned}$$

Hence, the value of given expression is  $\boxed{10}$ .

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