



Rationalisation Ex 3.2 Q2

Answer :

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

$$\begin{aligned}\frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} &= \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ &= \frac{2\sqrt{3}}{3} \\ &= \frac{2 \times 1.732}{3} \\ &= \frac{3.464}{3} \\ &= 1.1547\end{aligned}$$

The value of expression 1.1547 can be round off to three decimal places as 1.155.

Hence the given expression is simplified to $\boxed{1.155}$.

(ii) We know that rationalization factor of the denominator is $\sqrt{10}$. We will multiply numerator and denominator of the given expression $\frac{3}{\sqrt{10}}$ by $\sqrt{10}$, to get

$$\begin{aligned}\frac{3}{\sqrt{10}} \times \frac{\sqrt{10}}{\sqrt{10}} &= \frac{3 \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} \\ &= \frac{3\sqrt{10}}{10} \\ &= \frac{3 \times 3.162}{10} \\ &= \frac{9.486}{10} \\ &= 0.9486\end{aligned}$$

The value of expression 0.9486 can be round off to three decimal places as 0.949.

Hence the given expression is simplified to $\boxed{0.949}$.

(iii) We know that rationalization factor of the denominator is $\sqrt{2}$. We will multiply numerator and denominator of the given expression $\frac{\sqrt{5}+1}{\sqrt{2}}$ by $\sqrt{2}$, to get

$$\begin{aligned}\frac{\sqrt{5}+1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} &= \frac{\sqrt{10}+\sqrt{2}}{\sqrt{2} \times \sqrt{2}} \\ &= \frac{\sqrt{10}+\sqrt{2}}{2} \\ &= \frac{3.162+1.414}{2} \\ &= \frac{4.576}{2} \\ &= 2.288\end{aligned}$$

The value of expression 2.288 can be round off to three decimal places as 2.288.

Hence the given expression is simplified to $\boxed{2.288}$.

(iv) We know that rationalization factor of the denominator is $\sqrt{2}$. We will multiply numerator and denominator of the given expression $\frac{\sqrt{10}+\sqrt{15}}{\sqrt{2}}$ by $\sqrt{2}$, to get

$$\begin{aligned}\frac{\sqrt{10}+\sqrt{15}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} &= \frac{\sqrt{10} \times \sqrt{2} + \sqrt{15} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} \\ &= \frac{\sqrt{10} \times \sqrt{2} + \sqrt{5} \times \sqrt{3} \times \sqrt{2}}{2} \\ &= \frac{3.162 \times 1.414 + 2.236 \times 1.732 \times 1.414}{2} \\ &= \frac{9.947}{2} \\ &= 4.9746\end{aligned}$$

The value of expression 4.9746 can be round off to three decimal places as 4.975.

Hence the given expression is simplified to $\boxed{4.975}$.

(v) Given that $\frac{2+\sqrt{3}}{2}$

Putting the value of $\sqrt{3}$, we get

$$\begin{aligned}\frac{2+\sqrt{3}}{2} &= \frac{2+1.732}{2} \\ &= \frac{3.732}{2} \\ &= 1.24401\end{aligned}$$

The value of expression 1.24401 can be round off to three decimal places as 1.244.

Hence the given expression is simplified to $\boxed{1.244}$.

(vi) We know that rationalization factor of the denominator is $\sqrt{5}$. We will multiply numerator and denominator of the given expression $\frac{\sqrt{2}-1}{\sqrt{5}}$ by $\sqrt{5}$, to get

$$\begin{aligned}\frac{\sqrt{2}-1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} &= \frac{\sqrt{2} \times \sqrt{5} - \sqrt{5}}{\sqrt{5} \times \sqrt{5}} \\ &= \frac{\sqrt{10} - \sqrt{5}}{5}\end{aligned}$$

Putting the value of $\sqrt{10}$ and $\sqrt{5}$, we get

$$\begin{aligned}\frac{\sqrt{10} - \sqrt{5}}{5} &= \frac{3.162 - 2.236}{5} \\ &= \frac{0.926}{5} \\ &= 0.1852\end{aligned}$$

The value of expression 0.1852 can be round off to three decimal places as 0.185.

Hence the given expression is simplified to $\boxed{0.185}$.

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