Rationalisation Ex 3.2 Q1

Answer :

(i) We know that rationalization factor for $\frac{1}{\sqrt{a}}$ is $\sqrt{a}$. We will multiply numerator and denominator of the given expression $\frac{3}{\sqrt{5}}$ by $\sqrt{5}$, to get

$$\frac{3}{\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\frac{3\sqrt{5}}{\sqrt{5}\times\sqrt{5}}$$
$$=\frac{3\sqrt{5}}{5}$$

Hence the given expression is simplified to $\boxed{\frac{3\sqrt{5}}{5}}$.

(ii) We know that rationalization factor for $\frac{1}{\sqrt{a}}$ is $\sqrt{a}$. We will multiply numerator and denominator of the given expression $\frac{3}{2\sqrt{5}}$ by $\sqrt{5}$, to get

$$\frac{3}{2\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\frac{3\sqrt{5}}{2\sqrt{5}\times\sqrt{5}}$$
$$=\frac{3\sqrt{5}}{2\times5}$$
$$=\frac{3\sqrt{5}}{10}$$

Hence the given expression is simplified to $\boxed{\frac{3\sqrt{5}}{10}}$.

(iii) We know that rationalization factor for $\frac{1}{\sqrt{a}}$ is $\sqrt{a}$. We will multiply numerator and denominator of the given expression $\frac{1}{\sqrt{12}}$ by $\sqrt{12}$, to get

$$\frac{1}{\sqrt{12}}\times\frac{\sqrt{12}}{\sqrt{12}}=\frac{\sqrt{12}}{\sqrt{12}\times\sqrt{12}}$$
$$=\frac{\sqrt{12}}{12}$$
$$=\frac{\sqrt{4}\times\sqrt{3}}{12}$$
$$=\frac{2\times\sqrt{3}}{12}$$
$$=\frac{\sqrt{3}}{6}$$

Hence the given expression is simplified to $\boxed{\frac{\sqrt{3}}{6}}$.

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

$$\frac{\sqrt{2}}{\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\frac{\sqrt{2}\times\sqrt{5}}{\sqrt{5}\times\sqrt{5}}$$
$$=\frac{\sqrt{10}}{5}$$

Hence the given expression is simplified to $\boxed{\frac{\sqrt{10}}{5}}$.

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

$$\frac{\sqrt{3}+1}{\sqrt{2}}\times\frac{\sqrt{2}}{\sqrt{2}}=\frac{\sqrt{2}\times\sqrt{3}+\sqrt{2}}{\sqrt{2}\times\sqrt{2}}$$
$$=\frac{\sqrt{6}+\sqrt{2}}{2}$$

Hence the given expression is simplified to $\boxed{\frac{\sqrt{6}+\sqrt{2}}{2}}$.

(vi) We know that rationalization factor for $\frac{1}{\sqrt{a}}$ is $\sqrt{a}$. We will multiply numerator and denominator of the given expression $\frac{\sqrt{2}+\sqrt{5}}{\sqrt{3}}$ by $\sqrt{3}$, to get

$$\frac{\sqrt{2}+\sqrt{5}}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}=\frac{\sqrt{2}\times\sqrt{3}+\sqrt{5}\times\sqrt{3}}{\sqrt{3}\times\sqrt{3}}$$
$$=\frac{\sqrt{6}+\sqrt{15}}{3}$$

(vii) We know that rationalization factor for $\frac{1}{\sqrt{a}}$ is $\sqrt{a}$. We will multiply numerator and denominator of the given expression $\frac{3\sqrt{2}}{\sqrt{5}}$ by $\sqrt{5}$, to get

$$\frac{3\sqrt{2}}{\sqrt{5}}\times\frac{\sqrt{5}}{\sqrt{5}}=\frac{3\sqrt{2}\times\sqrt{5}}{\sqrt{5}\times\sqrt{5}}$$
$$=\frac{3\sqrt{10}}{5}$$

Hence the given expression is simplified to $\boxed{\frac{3\sqrt{10}}{5}}$.

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