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 $(11+\sqrt{11})(11-\sqrt{11})$.

$\therefore (11+\sqrt{11})(11-\sqrt{11})=11^2-(\sqrt{11})^2$

$=11\times 11-\sqrt{11}\times\sqrt{11}$

$=121-\sqrt{11\times 11}$

$=121-(11^2)^{\frac{1}{2}}$

$=121-11$

$=110$

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 $(5+\sqrt{7})(5-\sqrt{7})$.

$\therefore (5+\sqrt{7})(5-\sqrt{7})=5^2-(\sqrt{7})^2$

$=5\times 5-\sqrt{7}\times\sqrt{7}$

$=25-\sqrt{7\times 7}$

$=25-(7^2)^{\frac{1}{2}}$

$=25-7^1$

$=18$

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 $(\sqrt{8}-\sqrt{2})(\sqrt{8}+\sqrt{2})$.

$\therefore (\sqrt{8}-\sqrt{2})(\sqrt{8}+\sqrt{2})=(\sqrt{8})^2-(\sqrt{2})^2$

$=\sqrt{8}\times\sqrt{8}-\sqrt{2}\times\sqrt{2}$

$=\sqrt{8\times 8}-\sqrt{2\times 2}$

$=(8^2)^{\frac{1}{2}}-(2^2)^{\frac{1}{2}}$

$=8^1-2^1$

$=6$

Hence the value of expression is 6

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(iv) We know that $(a+b)(a-b)=a^2-b^2$. We will use this property to simplify the expression $(3+\sqrt{3})(3-\sqrt{3})$.

$\therefore (3+\sqrt{3})(3-\sqrt{3})=(3)^2-(\sqrt{3})^2$

$=3^2-\sqrt{3}\times\sqrt{3}$

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

$=9-(3^2)^{\frac{1}{2}}$

$=9-3^1$

$=6$

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

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

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

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

$=5^1-2^1$

$=3$

Hence the value of expression is 3.

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