

Exercise 1E

Question 5:

If a and b are integers and x is a natural number, then $(a+b\sqrt{x})$ and $(a-b\sqrt{x})$ are rationalising factor of each other, as $(a+b\sqrt{x})(a-b\sqrt{x}) = (a^2-b^2x)$, which is rational.

Therefore, we have,

$$\frac{1}{\left(5+3\sqrt{2}\right)} = \frac{1}{5+3\sqrt{2}} \times \frac{5-3\sqrt{2}}{5-3\sqrt{2}}$$
$$= \frac{5-3\sqrt{2}}{\left(5\right)^2 - \left(3\sqrt{2}\right)^2} = \frac{5-3\sqrt{2}}{25-18} = \left(\frac{5-3\sqrt{2}}{7}\right)$$

Question 6:

If a and b are integers, then

 $(\sqrt{a}+\sqrt{b})$ and $(\sqrt{a}-\sqrt{b})$ are rationalising factor of each other, as $(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = (a - b)$, which is rational.

Therefore, we have,
$$\frac{1}{(\sqrt{6} - \sqrt{5})} = \frac{1}{\sqrt{6} - \sqrt{5}} \times \frac{\sqrt{6} + \sqrt{5}}{\sqrt{6} + \sqrt{5}} = \frac{\sqrt{6} + \sqrt{5}}{(\sqrt{6}^2) - (\sqrt{5})^2} = \frac{\sqrt{6} + \sqrt{5}}{6 - 5}$$

$$= \frac{\sqrt{6} + \sqrt{5}}{1} = (\sqrt{6} + \sqrt{5}).$$

Ouestion 7:

If a and b are integers, then

 $(\sqrt{a}+\sqrt{b})$ and $(\sqrt{a}-\sqrt{b})$ are rationalising factor of each other, as $(\sqrt{a}+\sqrt{b})(\sqrt{a}-\sqrt{b})=(a-b)$, which is rational. Therefore, we have,

$$\frac{4}{(\sqrt{7} + \sqrt{3})} = \frac{4}{\sqrt{7} + \sqrt{3}} \times \frac{\sqrt{7} - \sqrt{3}}{\sqrt{7} - \sqrt{3}} = \frac{4(\sqrt{7} - \sqrt{3})}{(\sqrt{7})^2 - (\sqrt{3})^2}$$
$$= \frac{4(\sqrt{7} - \sqrt{3})}{7 - 3} = \frac{4(\sqrt{7} - \sqrt{3})}{4}$$
$$= (\sqrt{7} - \sqrt{3}).$$

****** END ******