Exercise 1.3

Question 13:

Rationalise the denominator in each of the following and hence evaluate by taking $\sqrt{2} = 1.414$, $\sqrt{3} = 1.732$ and $\sqrt{5} = 2.236$, upto three places of decimal.

(i) $\frac{4}{\sqrt{3}}$ **(ii)** $\frac{6}{\sqrt{6}}$ **(iii)** $\frac{\sqrt{10}-\sqrt{5}}{2}$

(iv) $\frac{\sqrt{2}}{2+\sqrt{2}}$ **(v)** $\frac{1}{\sqrt{3}+\sqrt{2}}$

Answer 13:

(i) $\frac{4}{\sqrt{3}}$

$$= \frac{4}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{3}}{3} = \frac{4 \times 1.732}{3} = \frac{6.928}{3} = 2.3093 = 2.309$$

(ii) $\frac{6}{\sqrt{6}}$

$$= \frac{6}{\sqrt{6}} \times \frac{\sqrt{6}}{\sqrt{6}} = \frac{6\sqrt{6}}{6} = \sqrt{6} = \sqrt{2} \times \sqrt{3} = 1.414 \times 1.732 = 2.4490 = 2.449$$

(iii) $\frac{\sqrt{10}-\sqrt{5}}{2}$

$$= \frac{\sqrt{5}(\sqrt{2}-1)}{2} = \frac{2.236(1.414-1)}{2} = 1.118 \times 0.414 = 0.4628 = 0.462$$

(iv) $\frac{\sqrt{2}}{2+\sqrt{2}}$

$$= \frac{\sqrt{2}}{2+\sqrt{2}} \times \frac{2-\sqrt{2}}{2-\sqrt{2}} = \frac{2\sqrt{2}-2}{2^2-(\sqrt{2})^2} = \frac{2(\sqrt{2}-1)}{4-2} = \frac{2(1.414-1)}{2} = 0.414$$

(v) $\frac{1}{\sqrt{3}+\sqrt{2}}$

$$= \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} = \frac{\sqrt{3}-\sqrt{2}}{(\sqrt{3})^2-(\sqrt{2})^2} = \frac{1.732-1.414}{3-2} = 0.318$$