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(Affiliated to CBSE up to +2 Level)

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SUB.: MATHS (NCERT BASED)

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## Rationalization

The process of making denominator of a irrational number to a rational by multiplying with a suitable number is called rationalization.

This process is adopted when the denominator of a given number is irrational.

The number by which we multiply the denominator or convert it into rational is called rationalizing factor.

1. Rationalise the denominators of the following:

(i)  $\frac{1}{\sqrt{7}}$       (ii)  $\frac{1}{\sqrt{7}-\sqrt{6}}$

Ans.

(i)  $\frac{1}{\sqrt{7}} = \frac{1 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{7}}{7}$

(ii)  $\frac{1}{\sqrt{7}-\sqrt{6}} = \frac{1 \times (\sqrt{7} + \sqrt{6})}{(\sqrt{7}-\sqrt{6})(\sqrt{7} + \sqrt{6})}$

[RF of  $(\sqrt{x} - \sqrt{y}) = (\sqrt{x} + \sqrt{y})$ ]

$$= \frac{(\sqrt{7} + \sqrt{6})}{(\sqrt{7})^2 - (\sqrt{6})^2} = \frac{(\sqrt{7} + \sqrt{6})}{7 - 6}$$

$$= \frac{(\sqrt{7} + \sqrt{6})}{1} = (\sqrt{7} + \sqrt{6})$$

Thus,  $\frac{1}{\sqrt{7} + \sqrt{6}} = (\sqrt{7} + \sqrt{6})$

Solve these questions:

(iii)  $\frac{1}{\sqrt{5} + \sqrt{2}}$       (iv)  $\frac{1}{\sqrt{7} - 2}$

2. Simplify:  $\frac{6}{2\sqrt{3} - \sqrt{6}} + \frac{\sqrt{6}}{\sqrt{3} + \sqrt{2}} - \frac{4\sqrt{3}}{\sqrt{6} - \sqrt{2}}$

3. Simplify:  $\frac{3\sqrt{2}}{\sqrt{6} - \sqrt{3}} + \frac{2\sqrt{3}}{\sqrt{6} + 2} - \frac{4\sqrt{3}}{\sqrt{6} - \sqrt{2}}$

4. . Show that:  $\frac{1}{3 - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - 2} = 5$