

# Rationalize Roots

By [BrushMyQuant](#)



YouTube Video Link to this Post is [Here](#)

Following is covered in the video

▣ How to Rationalize Roots

▣ Example 1 : Rationalize  $\frac{1}{\sqrt{3}-\sqrt{2}}$

▣ Example 2 : Rationalize  $\frac{1}{\sqrt{4}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{2}}$

## How to Rationalize Roots

- ▣ To Rationalize the denominator we do computations to move the root term to the numerator.
- ▣ This is usually done by multiplying the numerator and denominator with a conjugate of the denominator.
- ▣ Thus the denominator becomes a whole number.

### Example 1 : Rationalize $\frac{1}{\sqrt{3}-\sqrt{2}}$

To Rationalize  $\frac{1}{\sqrt{3}-\sqrt{2}}$  we will multiply the numerator and the denominator with the conjugate of the denominator.

We can find the conjugate of  $\sqrt{3}-\sqrt{2}$  by just inverting the sign between  $\sqrt{3}$  and  $\sqrt{2}$

=> Conjugate of  $\sqrt{3}-\sqrt{2}$  will be  $\sqrt{3}+\sqrt{2}$

$$\begin{aligned} \Rightarrow \frac{1}{\sqrt{3}-\sqrt{2}} &= \frac{1}{\sqrt{3}-\sqrt{2}} * \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} \\ &= \frac{\sqrt{3}+\sqrt{2}}{(\sqrt{3}-\sqrt{2})(\sqrt{3}+\sqrt{2})} \end{aligned}$$

Now the denominator is of the form  $(a-b) * (a+b)$  and will be equal to  $a^2-b^2$

$$\Rightarrow = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}^2 - \sqrt{2}^2} = \frac{\sqrt{3}+\sqrt{2}}{3-2} = \sqrt{3} + \sqrt{2}$$

**Example 2 : Rationalize**  $\frac{1}{\sqrt{4}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{2}}$

Following above logic we can find that  $\frac{1}{\sqrt{4}+\sqrt{3}} = \sqrt{4} - \sqrt{3}$  and  $\frac{1}{\sqrt{3}+\sqrt{2}} = \sqrt{3} - \sqrt{2}$

$$\Rightarrow \frac{1}{\sqrt{4}+\sqrt{3}} + \frac{1}{\sqrt{3}+\sqrt{2}} = \sqrt{4} - \sqrt{3} + \sqrt{3} - \sqrt{2} = \sqrt{4} - \sqrt{2} = 2 - \sqrt{2}$$

Hope it helps!  
Good Luck!

[Watch this video to learn the Properties of Roots](#)