What you will learn about:
Dividing Square Roots

$\frac{\sqrt{6}}{3} \neq \sqrt{2}$

$\sqrt{24} = 2\sqrt{6}$

$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$

Simplify:

$\frac{\sqrt{54}}{6} = \frac{3\sqrt{6}}{6} = \frac{\sqrt{6}}{2}$

$\frac{\sqrt{32}}{8} = \frac{4\sqrt{2}}{8} = \frac{\sqrt{2}}{2}$

$\frac{\sqrt{75}}{15} = \frac{5\sqrt{3}}{15} = \frac{\sqrt{3}}{3}$

$\frac{6-\sqrt{24}}{12}$

$\frac{6}{12} - \frac{\sqrt{24}}{12}$

$\frac{1}{2} - \frac{2\sqrt{6}}{12}$

$\frac{1}{2} - \frac{\sqrt{6}}{6}$

$\frac{8-\sqrt{40}}{12} = \frac{8}{12} - \frac{\sqrt{40}}{12}$

$\frac{2}{3} - \frac{2\sqrt{10}}{12}$

$\frac{2}{3} - \frac{\sqrt{10}}{6}$

$\frac{10+\sqrt{75}}{15} = \frac{10}{15} + \frac{\sqrt{75}}{15}$

$\frac{2}{3} + \frac{5\sqrt{3}}{15}$

$\frac{2}{3} + \frac{\sqrt{3}}{3}$

$\frac{\sqrt{27}}{\sqrt{75}}$

$\sqrt{\frac{27}{75}}$

$\sqrt{\frac{9}{25}} = \frac{3}{5}$

$\frac{\sqrt{48}}{\sqrt{108}}$

$\sqrt{\frac{48}{108}}$

$\sqrt{\frac{16}{36}} = \sqrt{\frac{4}{9}}$

$\frac{4}{9} = \frac{2}{3}$

$\frac{\sqrt{96}}{\sqrt{54}}$

$\sqrt{\frac{96}{54}} = \sqrt{\frac{16}{9}} = \frac{4}{3}$

$\frac{\sqrt{6y^5}}{\sqrt{2y}} = \sqrt{\frac{6y^5}{2y}}$

$= \sqrt{3y^4}$

$= y^2\sqrt{3}$

$\frac{\sqrt{12r^3}}{\sqrt{6r}} = \sqrt{\frac{12r^3}{6r}}$

$= \sqrt{2r^2}$

$= r\sqrt{2}$

$\frac{\sqrt{75y^5}}{\sqrt{108y}} = \sqrt{\frac{75y^5}{108y}}$

$= \sqrt{\frac{25y^4}{36}}$

$\frac{5y^2}{6}$

$\frac{\sqrt{50x^3}}{\sqrt{128x}}$

$\sqrt{\frac{50x^3}{128x}}$

$\sqrt{\frac{25x^2}{64}}$

$\frac{5x}{8}$

$\frac{\sqrt{162x^{10}y^2}}{\sqrt{2x^6y^6}}$

$\sqrt{\frac{162x^{10}y^2}{2x^6y^6}}$

$\sqrt{\frac{81x^4}{y^4}}$

$\frac{9x^2}{y^2}$

$\frac{\sqrt{300m^3n^7}}{\sqrt{3m^5n}}$

$\sqrt{\frac{300m^3n^7}{3m^5n}}$

$\sqrt{\frac{100n^4}{m^2}}$

$\frac{10n^3}{m}$

Rationalizing The Denominator

One Term denominator

Simplfy:

$\frac{4}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{4\sqrt{3}}{3}$

$\frac{6}{\sqrt{5}} \frac{\sqrt{5}}{\sqrt{5}}$

$\frac{6\sqrt{5}}{5}$

$-\frac{8}{3\sqrt{6}} \frac{\sqrt{6}}{\sqrt{6}}$

$-\frac{8\sqrt{6}}{18} = -\frac{4\sqrt{6}}{9}$

$\frac{5}{2\sqrt{5}} \frac{\sqrt{5}}{\sqrt{5}}$

$\frac{5\sqrt{5}}{10}$

$\frac{\sqrt{5}}{2}$

$-\frac{9}{4\sqrt{3}} \frac{\sqrt{3}}{\sqrt{3}}$

$\frac{-9\sqrt{3}}{12}$

$-\frac{3\sqrt{3}}{4}$

$\frac{12}{5\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}} = \frac{12\sqrt{2}}{5 \cdot 2}$

$= \frac{12\sqrt{2}}{10} = \frac{6\sqrt{2}}{5}$

$\frac{\sqrt{60}}{12} = \frac{2\sqrt{15}}{12}$

$= \frac{\sqrt{15}}{6}$

$\sqrt{\frac{5}{12}} = \frac{\sqrt{5}}{\sqrt{12}}$

$\frac{\sqrt{15}}{6}$

$\frac{\sqrt{5}}{2\sqrt{3}} \frac{\sqrt{3}}{\sqrt{3}}$

$\sqrt{\frac{7}{18}} = \frac{\sqrt{7}}{3\sqrt{2}} \frac{\sqrt{2}}{\sqrt{2}}$

$= \frac{\sqrt{14}}{6}$

$\sqrt{\frac{3}{32}} = \frac{\sqrt{3}}{4\sqrt{2}} \frac{\sqrt{2}}{\sqrt{8}}$

$= \frac{\sqrt{6}}{8}$

$\sqrt{\frac{11}{28}} = \frac{\sqrt{11}}{2\sqrt{7}} \frac{\sqrt{7}}{\sqrt{7}}$

$= \frac{\sqrt{77}}{14}$

$\sqrt{\frac{3}{27}} = \sqrt{\frac{1}{9}}$

$= \frac{1}{3}$

$\sqrt{\frac{10}{50}} = \sqrt{\frac{1}{5}} = \frac{\sqrt{1}}{\sqrt{5}} \frac{\sqrt{5}}{\sqrt{5}}$

$= \frac{\sqrt{5}}{5}$

Two – Term Denominator

multiply by Conjugate

$\frac{2}{(4+\sqrt{2})} \frac{(4-\sqrt{2})}{(4-\sqrt{2})}$

$\frac{8-2\sqrt{2}}{16-2}$

$\frac{8-2\sqrt{2}}{14}$

$\frac{8}{14} - \frac{2\sqrt{2}}{14}$

$\frac{4}{7} - \frac{\sqrt{2}}{7}$

$\frac{4-\sqrt{2}}{7}$

$\frac{2}{4-\sqrt{6}} \frac{(4+\sqrt{6})}{(4+\sqrt{6})}$

$\frac{8+2\sqrt{6}}{16-6}$

$\frac{8+2\sqrt{6}}{10}$

$\frac{8}{10} + \frac{2\sqrt{6}}{10}$

$\frac{4}{5} + \frac{\sqrt{6}}{5}$

$\frac{5}{2-3\sqrt{3}} \frac{(2+3\sqrt{3})}{(2+3\sqrt{3})}$

$(3\sqrt{3})(3\sqrt{3})$

$\frac{10+15\sqrt{3}}{4-27}$

$\frac{10+15\sqrt{3}}{-23}$

$-\frac{10}{23} - \frac{15\sqrt{3}}{23}$