7.2 Using Properties of Real and Rational Exponents

Std. 12.0

Examples: ***Simplify to an integer or fraction if possible; or leave in simplest radical form.***

1. $\dfrac{x^{5\sqrt{2}}}{x^{\sqrt{2}}} = x^{5\sqrt{2} - 1\sqrt{2}} = x^{4\sqrt{2}}$

2. $\dfrac{x^{1}y^{-1/5}}{x^{1/3}y^{4/5}}$ $\dfrac{x^{2/3}}{y^{4/5}\cdot y^{+1/5}} = \dfrac{x^{2/3}}{y} = \dfrac{\sqrt[3]{x^2}}{y}$

3. $\left(\dfrac{54^{1/4}}{27^{1/4}}\right)^2$ $\dfrac{2^{1/4}\cdot \cancel{27^{1/4}}}{\cancel{27^{1/4}}}$ $= \dfrac{54^{1/2}}{27^{1/2}} = \left(\dfrac{54}{27}\right)^{1/2} = 2^{1/2} = \sqrt{2}$

$\dfrac{a^n}{b^n} = \left(\dfrac{a}{b}\right)^n$

4. $\left(27^{1/2}\cdot 3^{1/2}\right)^{-3}$

$(ab)^n = a^n b^n$

$\left((27\cdot 3)^{1/2}\right)^{-3} = \left(81^{1/2}\right)^{-3} = 9^{-3} = \dfrac{1}{9^3} = \dfrac{1}{729}$

$\sqrt{81}$

5. $\sqrt[3]{9}\cdot\sqrt[4]{3}$

$\sqrt[3]{3^2}\cdot\sqrt[4]{3} = 3^{2/3}\cdot 3^{1/4} = 3^{11/12} = \sqrt[12]{3^{11}} = \sqrt[12]{\ }$

6. $\dfrac{\sqrt[5]{49}\cdot\sqrt{7}}{\sqrt[4]{49}} = \dfrac{\sqrt[5]{7^2}\cdot\sqrt[2]{7^1}}{\sqrt[4]{7^2}} = \dfrac{7^{2/5}\cdot \cancel{7^{1/2}}}{\cancel{7^{1/2}}}$

$\sqrt[5]{49}$