

Rational Exponents

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{\frac{x}{n}} = \sqrt[n]{a^x} = (\sqrt[n]{a})^x$$

A. Express in radical form.

1. $5^{\frac{1}{4}}$

2. $m^{\frac{1}{2}}$

3. $(5x^6)^{\frac{1}{2}}$

4. $6^{\frac{3}{4}}$

B. Express in exponent form.

1. $\sqrt[5]{x^9}$

2. $\sqrt[5]{6t^2}$

3. $\frac{1}{\sqrt[4]{5x^3}}$

4. $\frac{1}{\sqrt[3]{y^2}}$

Simplify completely:

1. $32^{\frac{1}{5}}$

2. $\left(5^{\frac{1}{3}}\right)^3$

3. $(-27)^{\frac{1}{3}}$

4. $(64)^{\frac{1}{6}}$

5. Evaluate (2 ways) $4^{\frac{3}{2}} = \left(4^{\frac{1}{2}}\right)^3$ or $4^{\frac{3}{2}} = (4^3)^{\frac{1}{2}}$

Simplify completely.

6. $(-64)^{\frac{1}{3}}$

7. $(-27)^{\frac{4}{3}}$

8. $(625^{-1})^{-\frac{1}{4}}$

9. $\frac{(27)^{\frac{2}{3}}}{(25)^{\frac{1}{2}}}$

10. $\left(\frac{25}{16}\right)^{-\frac{3}{2}}$

11. $\left(\frac{256}{81}\right)^{-\frac{5}{4}}$

12. $\left(81^{\frac{5}{2}}\right)^{\frac{1}{2}}$

13. $\left(\frac{49}{121}\right)^{-\frac{1}{2}}$

