

1. Each of the following is written in radical notation. Rewrite each with a rational exponent.

(a) $\sqrt{10}$

(d) $\sqrt[4]{a^2}$

(b) $\sqrt[3]{x}$

(e) $\sqrt[5]{7}$

(c) $\sqrt{x^3}$

(f) $\sqrt[3]{y^6}$

2. Each of the following is written with a rational exponent. Rewrite each in radical notation.

(a) $5^{1/2}$

(d) $x^{4/3}$

(b) $100^{1/2}$

(e) $a^{2/3}$

(c) $y^{1/5}$

(f) $x^{3/6}$

3. Simplify each of the following. You can convert from radical notation to fraction exponents, or vice versa, if that's helpful. Remember to take the root, before taking the power!

Which of these roots is not a real number?

(a) $\sqrt{64}$

(d) $\sqrt[3]{-64}$

(b) $\sqrt[3]{64}$

(e) $\sqrt[5]{32}$

(c) $\sqrt{-64}$

(f) $\sqrt[3]{-1}$

$$(g) \sqrt[4]{-1}$$

$$(l) -27^{-4/3}$$

$$(h) 16^{3/4}$$

$$(m) \left(\frac{49}{100}\right)^{1/2}$$

$$(i) 16^{-3/4}$$

$$(n) \left(\frac{49}{100}\right)^{-1/2}$$

$$(j) -16^{3/4}$$

$$(o) \left(\frac{100}{9}\right)^{-3/2}$$

$$(k) (-16)^{3/4}$$

4. Use the laws of exponents to simplify each of the following. Give your answer using only positive exponents.

$$(a) x^{1/4}x^{-5/4}$$

$$(d) \frac{p^{5/3}}{p^{2/3}}$$

$$(b) 2^{2/3}2^{-5/3}$$

$$(e) (a^{1/3}a^{1/4})^{12}$$

$$(c) (x^{1/2})^8$$

$$(f) \left(\frac{m^{-1/4}}{n^{-1/2}}\right)^{-4}$$