What about when there are variables involved?

Simplify. Assume all variables represent positive numbers.

a. $\sqrt{x^{10}}$

b. $\sqrt{y^{8}}$

c. $\sqrt{36z^{6}}$

d. $\sqrt{81a^{12}}$

$\sqrt{4a^{5}}$

$a^2 \cdot a^3 = a^{2+3} = a^5$

$(a^3)^2 = a^{3 \cdot 2} = a^6$

$\sqrt{16} = \pm 4$

$(\pm 4)^2 = 16$

3) Find the following cube roots.

$3\overline{)17}$ 5 r2

a. $\sqrt[3]{x^9}$

x^3

b. $\sqrt[3]{m^{17}}$

$m^5\sqrt{m^2}$

Check $(m^5)^3 = m^{15}$

$\sqrt{m^2 \cdot m^{15}} = \sqrt{m^{17}}$

c. $\sqrt[3]{-64n^6}$

$2 \cdot 2n^2$

$-4n^2$

d. $\sqrt[3]{8y^3}$

$2y$

Finding the nth root.

a. $\sqrt[4]{81}$

± 3

b. $\sqrt[5]{-1024}$

-4

c. $\sqrt[5]{32x^5y^{15}}$

$2xy^3$

d. $3\sqrt[3]{8x^6}$

$3 \cdot 2 \cdot x^2$

$6x^2$