Name: _____ Date: _____

Learning Goal 5.2	Use exponent laws to evaluate expression with positive and negative rational exponents.

Write each power as a radical, then simplify if possible.

a. $35^{2/3} = \left(\sqrt[3]{35}\right)^2$

b. $32^{3/2} = 2^7\sqrt{2}$

c. $(-32)^{2/5} = \left(\sqrt[5]{-32}\right)^2$
$= 4$

d. $400^{1.5} = \left(\sqrt{400}\right)^3$
$= 8000$

e. $(-125)^{1/3}$
$= \sqrt[3]{-125}$
$= -5$

f. $\left(\frac{8}{125}\right)^{2/3} = \left(\sqrt[3]{\frac{8}{125}}\right)^2$
$= \frac{4}{25}$

g. $(-1000)^{-2/3}$
$= \left(\sqrt[3]{-\frac{1}{1000}}\right)^2$
$= \frac{1}{100}$

h. $\left(\frac{1}{4}\right)^{-1/2} = \sqrt{4}$
$= 2$

i. $(-0.0008)^{-4/3}$
$= \left(\sqrt[3]{-\frac{10000}{8}}\right)^4$
$= 1\,600\,000\sqrt[3]{10}$

Write each radical as a fractional power with the smallest possible base.

a. $\sqrt[3]{81} = 3^{4/3}$

b. $\sqrt[4]{32} = 2^{5/4}$

c. $\left(\sqrt{10}\right)^3 = 10^{3/2}$

d. $\left(\sqrt[3]{-10}\right)^2 = (-10)^{2/3}$

e. $\left(\frac{1}{2\sqrt{2}}\right)^2 = \frac{1}{2^3}$

f. $\left(5\sqrt[3]{5}\right)^{-3} = \frac{1}{5^4}$

Example Paleontologists use measurements from fossilized dinosaur tracks and the formula

$$v = 0.155s^{5/3}f^{-7/6}$$

to estimate the speed at which the dinosaur travelled. In the formula, *v* is the speed in metres per second, *s* is the distance between successive footprints of the same foot, and *f* is the foot length in metres. If *s* = 1.5 m and *f* = 0.3 m, find the estimate the speed of the dinosaur.

1.24 m/s