Name: _____   Date: _____

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

Evaluate the following expressions **without a calculator.** Leave your answers as fractions.

a. 3^{-2}

b. 2^{-4}

c. $(0.3)^{-4}$

d. $\left(\dfrac{1}{3}\right)^{-3}$

e. $\left(-\dfrac{2}{3}\right)^{-2}$

f. $\dfrac{1}{5^{-3}}$

Simplify the following expressions to a single power with only positive exponents. Do not evaluate. Show all your work.

a. $(((11)^3 \times 11^{-7})^{-3})^2$

b. $(32^{-2} \times 128)^{-4}$

c. $(-(q^{-5} \times q^{-4})^2)^{-4}$

d. $-\left(\dfrac{t^{-9}}{t^{-12}}\right)^{-4}$

e. $\left(-\left(\dfrac{w^{-3}}{w^3}\right)^2\right)^{-8}$

f. $\left(\dfrac{-81^2}{27^{-6}}\right)^{-3}$