Name: _____   Date: _____

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

Recall the Product of Powers rule to simplify the following expressions.

a. $3^6 3^2$ b. $6^7 6^2$ c. $7^6 7$

And the Quotient of Powers rule:

d. $3^6 \div 3^2$ e. $\dfrac{6^2}{6^7} =$ f. $7 \div 7^6$

Take a (silent) minute. What do you think the negative exponents represent?

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

    a. 7^{-2}

    b. $(-1.5)^{-3}$

    c. $\left(-\dfrac{3}{4}\right)^{-3}$

    d. $\left(\dfrac{10}{3}\right)^{-2}$

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

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

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

    c. $\left(-\dfrac{x^{-5}}{x^2}\right)^{-4}$

    d. $\left(\dfrac{64}{32^{-2}}\right)^{-4}$