

Learning Goal(s):

### 1.5.1: Simplifying and Evaluating Expressions Using the Laws of Exponents

Date: \_\_\_\_\_

Ex. 1 Evaluate without using a calculator. [You must use the laws of exponents]

a)  $3^{-2}$    b)  $\left(\frac{1}{4}\right)^{-2}$    c)  $\frac{1}{4^{-2}}$    d)  $\left(\frac{3}{4}\right)^{-2}$    e)  $\left(-\frac{2}{5}\right)^{-3}$    f)  $\left(\frac{81}{16}\right)^{\frac{1}{2}}$    g)  $27^{\frac{2}{3}}$    h)  $64^{\frac{4}{3}}$    i)  $\left(\frac{16}{81}\right)^{\frac{1}{4}}$

Ex. 2 Simplify using the laws of exponents.

a)  $\sqrt{x^6 y^{12}}$    b)  $x^2 \div x^{\frac{3}{2}}$    c)  $\left(x^{\frac{2}{5}}\right)^{\frac{5}{8}}$    d)  $\sqrt{81x^{16}y^{100}}(2x^{-4}y^3)^2$

Ex. 3

a) Simplify  $\frac{a^3 b^2 c^3}{\sqrt{a^2 b^4}}$ , and then evaluate for  $a=4$ ,  $b=9$ , and  $c=-3$ .   b) Verify your answer by evaluating the expression without simplifying first.