Name: _____   Date: _____

Section 6.1 Exponent Laws

1. Simplify, then evaluate. Give your answer as a whole number or a fraction.
   a) $4^{-3} \times 4^5$ b) $3^{-1} \times 3^{-3}$
   c) $5^3 \times 5^{-7} \times 5^3$ d) $2^{-5} \times 2^{-4} \times 2^2$

2. Refer to question 1. Write each power with a negative exponent as a power with a positive exponent. Then, evaluate. Use a calculator to check your answers.

3. Write each power as a fraction with a positive exponent.

   a) $\left(\dfrac{4}{5}\right)^{-3}$ b) $\left(\dfrac{3}{8}\right)^{-2}$

4. Simplify each expression. Then evaluate for the given values. Give your answer as a whole number or a fraction.
   a) $(g^{-2})(g^{-1})(g^4)$, for $g = 5$
   b) $(w^{-5})(w^{-4})(w^7)$, for $w = 3$
   c) $(p^{-3})(p^5 q^{-2})$, for $p = 4$ and $q = -1$
   d) $(a^{-2}b^5)(a^{-1}b^{-2})$, for $a = -2$ and $b = -3$

5. Simplify, then evaluate. Give your answer as a whole number or a fraction.
   a) $7^4 \div 7^7$ b) $5^{-6} \div 5^{-4}$
   c) $\dfrac{2^6}{2^{-3}}$ d) $\dfrac{10^{-5}}{10^{-3}}$

6. Simplify each expression. Then evaluate for the given values. Give your answer as a whole number or a fraction.
   a) $(x^{-2} \div x^{-5})$, for $x = -3$
   b) $(z^{-6} \div z^{-4})$, for $z = 4$
   c) $\dfrac{b^{-3}c^5}{bc^{-2}}$, for $b = -1$ and $c = 2$
   d) $(s^{-3}t^2) \div (s^{-5}t^{-1})$, for $s = 5$ and $t = 2$

7. Simplify, then evaluate. Give your answer as a whole number or a fraction.
   a) $(4^3)^{-1}$ b) $(5^{-1})^{-3}$
   c) $[(-2)^{-2}]^{-4}$ d) $[(-10)^3]^{-2}$

8. Simplify each expression. Then evaluate for the given values. Give your answer as a whole number or a fraction.
   a) $(w^{-2})^{-1}$, for $w = 7$
   b) $(5x^3)^{-2}$, for $x = -2$
   c) $(p^2q^3)^{-2}$, for $p = 3$ and $q = -1$
   d) $(b^{-2}c^3)^{-1}$, for $b = 4$ and $c = 5$

9. Simplify. Write your answer as a power with a positive exponent.
   a) $y^3 \times y^5$ b) $v^{-4} \div v$
   c) $m^2n^4 \times m^{-2}n^{-3}$ d) $\dfrac{a^4b^{-5}}{a^3b^3}$
   e) $(s^{-3})^{-1}$ f) $\left(\dfrac{x^{-3}}{y^{-1}}\right)^{-2}$

10. Simplify, then evaluate to three decimal places.
    a) $\dfrac{1.07^8}{1.07^{11}}$
    b) $\dfrac{1.04^{-1}}{1.04^3}$
    c) $(8.1^{-3})^{-1}$
    d) $(-1.01^3)^{-2}$

11. a) Evaluate $(k^4)^{-2} + (k^{-3})(k^2)$ for $k = 2$.
    b) Use a CAS graphing calculator to check your answer to part a).