## Zero and Negative Exponents – Assigned Problems

**1.** Rewrite each expression as an equivalent expression with a positive exponent.

a) $4^{-6}$ b) $\left(\frac{7}{3}\right)^{-5}$ c) $\frac{1}{8^{-2}}$ d) $(-3)^{-2}$

**2.** Evaluate each expression without using a calculator.

a) $(8)^{0}$ b) $5^{-3}$ c) $\left(\frac{3}{2}\right)^{-3}$ d) $(-2)^{-4}$

**3.** Use your calculator to evaluate each expression.

a) $8^{-2}$ b) $4^{-3}$ c) $\left(\frac{5}{2}\right)^{-3}$ d) $\left(-\frac{1}{2}\right)^{-3}$

**4.** Evaluate.

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a) $10^{-2}$ c) $\left(\frac{1}{2}\right)^{-5}$ e) $\frac{1}{(-9)^{2}}$

b) $(-4)^{-2}$ d) $\left(\frac{1}{7}\right)^{-3}$ f) $(-5)^{0}$

**5.** Simplify. Write each expression as a single power with a positive exponent.

a) $9^{7} \times 9^{-3}$ c) $8^{6} \div 8^{-5}$ e) $(-3)^{-8} \times (-3)^{9}$

b) $6^{-3} \div 6^{-5}$ d) $17^{-4} \div 17^{-6}$ f) $(-4)^{-5} \times (-4)^{5}$

6. Simplify the following. Your answer should be a power with no negative exponents.

a) $2^{4}(2^{2}) \div 2^{-6}$ b) $\left(\frac{9^{-2}}{(9^{2})^{2}}\right)^{2}$

**ANSWERS**

**1.** a) $\frac{1}{4^6}$ b) $\left(\frac{3}{7}\right)^5 = \frac{3^5}{7^5}$ c) $8^2$ d) $\frac{1}{(-3)}$

**2.** a) 1 b) $\frac{1}{125}$ c) $\frac{8}{27}$ d) $\frac{1}{16}$

**3.** a) 0.015 625 b) 0.015 625 c) 0.064 d) $-8$

**4.** a) $\frac{1}{100}$ c) 32 e) $\frac{1}{81}$

b) $\frac{1}{16}$ d) 343 f) 1

**5.** a) $9^4$ c) $8^{11}$ e) $(-3)^1$

b) $6^2$ d) $17^2$ f) $(-4)^0$

6. a) $2^{18}$ b) $\frac{1}{9^{12}}$