AChor/MPM1D **Name:_____**
Date: _____

Exponent Law Practice

1. Write the following using power notation. For each power, identify the base and exponent.

a) $3 \times 3 \times 3 \times 3 =$ _____
base = _____
exponent =_____

b) $(-3) \times (-3) \times (-3) \times (-3) =$ _____
base = _____
exponent = _____

c) $-(3 \times 3 \times 3 \times 3) =$ _____
base = _____
exponent = _____

2. The Exponent Laws or Rules: (Fill in the blanks)

Exponent Law 1) $x^m \times x^n =$ _____

Exponent Law 2) $x^m \div x^n =$ _____

Exponent Law 3) $(x^m)^n =$ _____

Exponent Law 4) $x^0 =$ _____

Exponent Law 5) $x^1 =$ _____

Exponent Law 6) $x^{-n} =$ _____

Exponent Law 7) $(xy)^n =$ _____

Exponent Law 8) $(x^a y^b)^n =$ _____

Exponent Law 9) $\left(\frac{x}{y}\right)^n =$ _____

Exponent Law 10) $\left(\frac{x}{y}\right)^{-n} =$ _____

3. Write as a <u>single power with positive exponent</u>.

a) $4^{-3} \times 4^2$

b) $7^{10} \times 7^3 \times 7^{-5}$

c) $(-x)^2 \times (-x)^4$

d) $(y^2)^4$

4. Write the following as single powers with positive exponents.

a) $10^3 \times 10^{-5}$

b) $10^{-4} \times 10^{-3}$

c) $(10^{-4})^2 \times 10^{-1}$

d) $x^0 \times x^8$

e) $y^4 \div y^{-5} \times y^6$

f) $x^4 \times x^{-5} \div x^6$

g) $(10^{-5})^3 \cdot (10^5)^3$

h) $10^{-5} \div 10^{-3}$

i) $\dfrac{((-5)^2)^5(-5)^{-3}}{(-5)^4}$

5. Evaluate.

a) $5^{-1}+\left(\frac{1}{2}\right)^2$

b) $(2^{-2}\times 3^2)(2\times 3)$

c) $\frac{3}{4}-2^{-3}$

d) $(2^3\times 2^7\times 5^3)(5^{-3}\times 2^{-5})$

6. If $x=-2,\ \ y=-3$**,** $a=2$**, and** $b=1$**, find each value.**

a) a^3

b) $x^{-1}+y^{-1}$

c) $(ab)^3$

d) y^x

e) $-x^2+a^{-1}$

f) $\left(\frac{a}{b}\right)^x$

Answers**: 1**(a) 3^4, 3, 4; (b) $(-3)^4$, -3, 4; (c) -3^4, 3, 4; **3** (a) $\frac{1}{4}$, (b) 7^8, (c) $(-x)^6$, (d) y^8; **4** (a) $\frac{1}{10^2}$, (b) $\frac{1}{10^7}$, (c) $\frac{1}{10^9}$, (d) x^8, (e) y^{15}, (f) $\frac{1}{x^7}$, (g) 10^0, (h) $\frac{1}{10^2}$, (i) $(-5)^3$; **5** (a) $\frac{9}{20}$, (b) $\frac{27}{2}$ or $13\frac{1}{2}$, (c) $\frac{5}{8}$, (d) 32; **6** (a) 8, (b) $-\frac{5}{6}$, (c) 8, (d) $\frac{1}{9}$, (e) $-3\frac{1}{2}$, (f) $\frac{1}{4}$