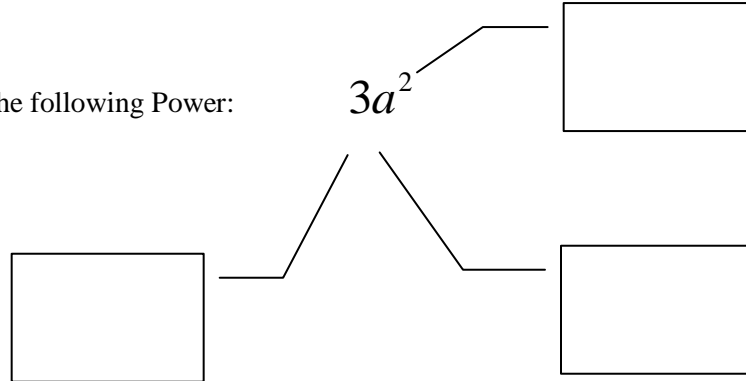


**Section 5.1 – Rules of Exponents.**

Quality – Accuracy – Transfer – 100%

**Section 1. The Meaning of a “Power”.**

1. Name the Parts of the following Power:



2. Write the following using exponents:

- a.  $x \cdot x \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y$  a. \_\_\_\_\_
- b.  $a \cdot a \cdot a \cdot b \cdot b \cdot b \cdot b$  b. \_\_\_\_\_
- c.  $2 \cdot m \cdot m \cdot m \cdot m \cdot n \cdot n \cdot n$  c. \_\_\_\_\_

3. Write the following WITHOUT Using Exponents.

- a.  $x^2y^4$  a. \_\_\_\_\_
- b.  $a^4bc^3$  b. \_\_\_\_\_
- c.  $4^3 \cdot 3^2$  c. \_\_\_\_\_

**Section 2. The Product Rule for Exponents:** \_\_\_\_\_

4. Multiply Each Expression Using the Product Rule:

- a.  $x^5 \cdot x^2$  a. \_\_\_\_\_
- b.  $3^2 \cdot 3$  b. \_\_\_\_\_
- c.  $2^2 \cdot 2^4$  c. \_\_\_\_\_
- d.  $x^2 \cdot x^6$  d. \_\_\_\_\_
- e.  $y^4 \cdot y^7$  e. \_\_\_\_\_

**Section 3. The Quotient Rule for Exponents:** \_\_\_\_\_

5. Perform each Division:

a.  $x^8 \div x^5$

a. \_\_\_\_\_

b.  $x^5 / x^3$

b. \_\_\_\_\_

c.  $\frac{3^5}{3^2}$

c. \_\_\_\_\_

d.  $\frac{6^4}{6}$

d. \_\_\_\_\_

e.  $\frac{x^{12}}{x^5}$

e. \_\_\_\_\_

f.  $\frac{z^8}{z}$

f. \_\_\_\_\_

6. Special Cases – Division:

a.  $\frac{c^4}{c^7}$

a. \_\_\_\_\_

b.  $\frac{y^5}{y^9}$

b. \_\_\_\_\_

c.  $\frac{x^3}{x^4}$

c. \_\_\_\_\_

**Section 4. The Zero-Exponent Rule:** \_\_\_\_\_

7. Simplify the Following Expressions:

a.  $3^0$

a. \_\_\_\_\_

b.  $x^0$

b. \_\_\_\_\_

c.  $3x^0$

c. \_\_\_\_\_

d.  $(3x)^0$

d. \_\_\_\_\_

e.  $4x^4 y^2 z^0$

e. \_\_\_\_\_

NOTE:  $0^0$  \_\_\_\_\_

\_\_\_\_\_

**Section 5. The Power Rule for Exponents:** \_\_\_\_\_

8. Apply the Power Rule for the Following Expressions:

a.  $(x^5)^3$  \_\_\_\_\_

b.  $(3^4)^2$  \_\_\_\_\_

c.  $(y^5)^7$  \_\_\_\_\_

9. The Extended Power Rule: \_\_\_\_\_

a.  $\left(\frac{ax}{by}\right)^4$  \_\_\_\_\_

b.  $(4x)^2$  \_\_\_\_\_

c.  $(-x)^3$  \_\_\_\_\_

d.  $(5xy^2)^3$  \_\_\_\_\_

e.  $\left(\frac{-3y}{2z}\right)^2$  \_\_\_\_\_

10. Order of Operations and the Extended Power Rule:

a.  $\left(\frac{9x^3y^2}{3xy^2}\right)^3$  \_\_\_\_\_

b.  $\left(\frac{25x^4y^3}{5x^2y^7}\right)^4$  \_\_\_\_\_

c.  $(3y^3z^4)^2(2y^4z)$  \_\_\_\_\_

d.  $(5x^4z^{10})^2(2x^2y^8)$  \_\_\_\_\_

**Section 5.2: Negative Exponents – What Are They:**

1. Solve by The Quotient Rule: Show all work...

$\frac{x^3}{x^5}$  Solve by the Quotient Rule:

$\frac{x^3}{x^5}$  Solve by Showing the Structural Work:

2. Simply Stated: the Negative Exponent Rule: \_\_\_\_\_

3. Simplify the Following Expressions: Write each answer with positive exponents only. Simplify.

a.  $x^{-6}$  \_\_\_\_\_

c.  $4^{-2}$  \_\_\_\_\_

b.  $x^{-7}$  \_\_\_\_\_

d.  $5^{-3}$  \_\_\_\_\_

4. Consider Negative Exponents Presented Another Way:

a.  $\frac{1}{x^{-2}}$  \_\_\_\_\_

b.  $\frac{1}{5^{-1}}$  \_\_\_\_\_

5. Practice Using the Power Rule:

a.  $(x^{-5})^4$  \_\_\_\_\_ = \_\_\_\_\_

b.  $(4^2)^{-3}$  \_\_\_\_\_ = \_\_\_\_\_

6. Practice Using Product Rule:

a.  $x^3 \cdot x^{-5}$

b.  $3^{-4} \cdot 3^{-7}$

7. Practice Using the Quotient Rule:

a.  $\frac{x^{-5}}{x^{13}}$

b.  $\frac{6^{-7}}{6^{-5}}$

8. Negative Product and Power Rule:

a.  $\frac{8z^{-4}}{32x^{-2}}$

b.  $\frac{18m^{-3}n^0}{6m^5n^9}$

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

d.  $\left(\frac{5m^{-1}n^{-3}}{p^2}\right)^{-3}$

9, CONCEPT: “MIGRATION”.

a.  $7x^4(6x^{-9})$

b.  $\frac{16r^3s^{-3}}{8rs^2}$

c.  $\frac{2x^2y^5}{8x^7y^{-4}}$

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

e.  $\left(\frac{x^5}{y^7}\right)^{-4}$

f.  $\left(\frac{x^2y^{-3}}{z^4}\right)^{-5}$

g.  $\left(\frac{2x^{-3}y^2z}{x^2}\right)^2$

h.  $\left(\frac{x^3y^{-4}z}{y^{-2}}\right)^{-6}$

**Homework Section:**

<b>Section(2)</b>	<b>Page(s)</b>	<b>Problem(s)</b>
5.1	289 → 291	11 → 131 EOO*
5.2	300 → 301	11 → 129 EOO*

\*Every Other Odd