

## Pre-Calculus Worksheet

Name: \_\_\_\_\_

## NEEDED SKILLS for Exponents

Period: \_\_\_\_\_

NOTE: For the RULES, let  $a$  and  $b$  be real numbers and  $m$  and  $n$  positive integers.**DAY ONE:** Simplify. Write your final answer with positive exponents ONLY.

|  |                       |              |              |                        |                   |
|--|-----------------------|--------------|--------------|------------------------|-------------------|
| Rule:<br>$a^{-m} = \frac{1}{a^m}$<br><br>AND<br>$\frac{1}{a^{-m}} = a^m$ | 1. $\frac{1}{a^{-3}}$ | 2. $m^{-12}$ | 3. $2y^{-5}$ | 4. $\frac{5}{4r^{-3}}$ | 5. $-12a^4b^{-7}$ |
|--|-----------------------|--------------|--------------|------------------------|-------------------|

**DAY TWO:** Simplify. Write your final answer with positive exponents ONLY.

|                                    |                    |                         |                          |                                 |                            |
|------------------------------------|--------------------|-------------------------|--------------------------|---------------------------------|----------------------------|
| Rule:<br>$a^m \cdot a^n = a^{m+n}$ | 1. $z^2 \cdot z^3$ | 2. $2a^9 \cdot 5a^{-2}$ | 3. $(-4t^{-3})(5t^{-5})$ | 4. $-2x^{-1}y^{-4} \cdot 3x^2y$ | 5. $z^{n+2} \cdot z^{n-2}$ |
|------------------------------------|--------------------|-------------------------|--------------------------|---------------------------------|----------------------------|

**DAY THREE:** Simplify. Write your final answer with positive exponents ONLY.

|                             |                |              |                               |                                 |                           |
|-----------------------------|----------------|--------------|-------------------------------|---------------------------------|---------------------------|
| Rule:<br>$(ab)^m = a^m b^m$ | 1. $(xy)^{-3}$ | 2. $(4ac)^3$ | 3. $(-6x)^2 \cdot (2xy)^{-2}$ | 4. $(rt)^{-2} \cdot r^3 t^{-5}$ | 5. $(5ac)^4 \cdot (3c)^2$ |
|-----------------------------|----------------|--------------|-------------------------------|---------------------------------|---------------------------|

**DAY FOUR:** Simplify. Write your final answer with positive exponents ONLY.

|                             |               |                        |                      |                                |                            |
|-----------------------------|---------------|------------------------|----------------------|--------------------------------|----------------------------|
| Rule:<br>$(a^m)^n = a^{mn}$ | 1. $(4s^3)^4$ | 2. $(5x^2y^{-4})^{-2}$ | 3. $(-2c^{-3}d^4)^3$ | 4. $(-x^2y)^3 \cdot (x^{-5}y)$ | 5. $(9a^2)^{-2}(-3ab^2)^3$ |
|-----------------------------|---------------|------------------------|----------------------|--------------------------------|----------------------------|

**DAY FIVE:** Simplify. Write your final answer with positive exponents ONLY.

|                                      |                         |                           |                            |                                      |  |
|--------------------------------------|-------------------------|---------------------------|----------------------------|--------------------------------------|--|
| Rule:<br>$\frac{a^m}{a^n} = a^{m-n}$ | 1. $\frac{x^{-3}}{x^7}$ | 2. $\frac{5a^{13}}{2a^4}$ | 3. $\frac{-4a^2}{a^{-10}}$ | 4. $\frac{s^{-2}t^{-3}}{4s^{-1}t^5}$ | 5. $\left(\frac{a^4}{b^{-6}}\right) \cdot 10a^{-7}b^2$ |
|--------------------------------------|-------------------------|---------------------------|----------------------------|--------------------------------------|--|

**DAY SIX:** Simplify. Write your final answer with positive exponents ONLY.

|   |                                  |   |  |   |   |
|---|----------------------------------|---|--|---|---|
| Rule:<br>$\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}$ | 1. $\left(\frac{3x}{4}\right)^2$ | 2. $\left(\frac{r^{-5}}{3s^2}\right)^4$ | 3. $\left(\frac{7t^{-2}}{st^{-3}}\right)^2 \cdot \frac{t^5}{s^{-6}}$ | 4. $\left(-\frac{v^{-2}}{4w}\right)^{-3} \left(\frac{w^2}{v^{-1}}\right)^2$ | 5. $\left(\frac{12x^4}{3x^{-2}}\right)^3$ |
|---|----------------------------------|---|--|---|---|

**DAY SEVEN:** Simplify. Write your final answer with positive exponents ONLY.

|                    |            |                               |  |                             |                                     |
|--------------------|------------|-------------------------------|--|-----------------------------|-------------------------------------|
| Rule:<br>$a^0 = 1$ | 1. $-6x^0$ | 2. $2a^3b^{-6} \cdot 5a^0b^2$ | 3. $\left(\frac{100x^3y}{13z^{-5}}\right)^0$ | 4. $(2m^4n)^2(-5^0mn^{-1})$ | 5. $\frac{10a^{-13}}{-20a^{10}a^0}$ |
|--------------------|------------|-------------------------------|--|-----------------------------|-------------------------------------|

**DAY EIGHT:** Simplify. Write your final answer with positive exponents ONLY.

|                              |                         |                                  |  |
|------------------------------|-------------------------|----------------------------------|--|
| 1. $(7x^2yz^{-4})(3x^{-3}y)$ | 2. $(5t)^{-2}(-2t^3)^3$ | 3. $(-4x^{-5}z^2)^{-2}(8x^{-8})$ | 4. $\left(\frac{12m^{-5}n}{-56m^{10}n^2}\right)^0$ |
|------------------------------|-------------------------|----------------------------------|--|

**DAY NINE:** Simplify. Write your final answer with positive exponents ONLY.

|                                   |                         |                           |                                     |
|-----------------------------------|-------------------------|---------------------------|-------------------------------------|
| 1. $3t^n \cdot t^{-2} \cdot 8t^n$ | 2. $(6c^2)(-3c^{-4})^2$ | 3. $-8b^3(-3b^2 + b - 6)$ | 4. $2rs^2(-r^3s^2)^3 + (3r^5s^4)^2$ |
|-----------------------------------|-------------------------|---------------------------|-------------------------------------|

