

**I. Complete each problem. You must show your work on a SEPARATE SHEET OF PAPER!
NO WORK MEANS NO CREDIT!!!**

1.) Simplify the following: $3^4 x^3 y^{-5} z^0$ _____

2.) Simplify the following: $(2a^4 b^2)^3$ _____

3.) Simplify the following: $(4x^6 y^{-2})(3x^5 y^8)$ _____

4.) Simplify the following: $\frac{18m^3 n^{-4}}{9m^5 n^{-7}}$ _____

5.) Simplify the following: $(4^2 c^{-5} d^7 e^{-1})^2 (2^{-3} c^{12} d^{-9} e^2)$ _____

6.) Simplify the following: $\left(\frac{6a^4 b^{-2} a^3}{4b^8}\right)^{-3}$ _____

7.) Which expression represents the simplified form of $(x^{m-3})^6$? Circle your answer below:

(A) x^{6m-3}

(B) x^{6m-18}

(C) x^{6m}

(D) x^{6m-729}

8.) Evaluate the following for $a = -3$ and $b = 2$: $\frac{a^{-3} b^4}{(3a^{-1} b^2)^{-3}}$ _____

9.) Simplify the expression to the right.

MUST SHOW ALL OF YOUR WORK FOR CREDIT!

Use the space below to show your work:

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

II. Explain why each expression is NOT in SIMPLEST FORM.

10.) $x^5 \cdot x^6 \rightarrow$ _____

11.) $4m^3 \cdot 7n^2 \rightarrow$ _____

12.) $3a^{-7} b^8 \rightarrow$ _____

13.) $p^6 s^0 t^2 \rightarrow$ _____

III. Error Analysis

Find the mistake – The following problem is worked out for you. State the step that contains the FIRST mistake then CORRECT IT and provide the correct answer.

$$\frac{(2x^3y^4z^{-5})^3(x^4y^{-6}z)^{-1}}{(3x^{-4}y^3z^{-6})^{-2}(4x^{-1}y^3z^7)^0}$$

$$\boxed{\text{Step 1}} \rightarrow \frac{(2x^3y^4z^{-5})^3(x^4y^{-6}z)^{-1}}{(3x^{-4}y^3z^{-6})^{-2}(4x^{-1}y^3z^7)^0} = \frac{(2x^3y^4z^{-5})^3(x^4y^{-6}z)^{-1}}{(3x^{-4}y^3z^{-6})^{-2}}$$

$$\boxed{\text{Step 2}} \rightarrow \frac{2^3x^9y^{12}z^{-15} \cdot x^{-4}y^6z^{-1}}{3^{-2}x^8y^{-6}z^{12}}$$

$$\boxed{\text{Step 3}} \rightarrow \frac{8x^9y^{12}z^{-15} \cdot x^{-4}y^6z^{-1}}{3^{-2}x^8y^{-6}z^{12}}$$

$$\boxed{\text{Step 4}} \rightarrow \frac{8 \cdot 3^2x^{13}y^6z^{-14}}{x^8y^{-6}z^{12}}$$

$$\boxed{\text{Step 5}} \rightarrow 72x^{21}y^0z^{-2}$$

$$\boxed{\text{Step 6}} \rightarrow \frac{72x^{21}}{z^2}$$

Step with the first mistake: _____ correct answer: _____

IV. Use the exponential growth and decay model to complete each problem below.

15.) Suppose you deposit \$5,000 in a savings account that pays interest at an annual rate of 2.5% where no money is added or withdrawn.

a.) How much will be in the account after 5 years?

b.) How many years will it take for the account to contain \$4,500?

16.) A new truck sells for \$29,000 and it depreciates 8.5% each year.

a.) What is the value of the truck after 7 years?

b.) How many years will it take for the value of the truck to be less than \$5,000?