

Answer each question, making sure to **SHOW ALL OF YOUR WORK** in the space provided. You must use the indicated method to earn full credit. Take the time to check your work. Write neatly.

1. *Simplify.*

$$(4m^8p^4)(-8m^6p)$$

2. *Simplify.*

$$\frac{-14p^3y^{12}t^5}{7py^8t^{-7}}$$

3. *Simplify.*

$$(-2h^5mp^9)^6$$

4. *Simplify.*

$$\left(-\frac{8f^3g^{-2}h^8}{5fg^2h^9}\right)^0$$

5. *Simplify.*

$$\frac{s^2t^8f^{-7}u^9}{st^5f^8u^{-2}}$$

6. *Simplify.*

$$\sqrt{300}$$

7. *Simplify.*

$$\sqrt{192}$$

8. *Simplify.*

$$\sqrt{12b^8c^7}$$

9. *Rationalize the denominator.*

$$\frac{4}{\sqrt{12}}$$

10. *Simplify.*

$$2\sqrt{3} - 2\sqrt{5} - 8\sqrt{3} + 5\sqrt{5}$$

11. Simplify.

$$6\sqrt{3}(2\sqrt{3} + 5\sqrt{7})$$

12. Solve.

$$6^x = 46656$$

13. Solve.

$$3^{2x+1} = 243$$

BONUS:

The formula to find the volume of a rectangular prism is $V = \text{Base Area} \times \text{height}$. If the base of the prism is a square with side length $3m^2n$ and the height is $5m^3n^2$, write a simplified expression that represents the volume of the prism.

