

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.

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

$$-32m^{14}p^5$$

2. Simplify.

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

$$-2p^2y^4t^{12}$$

3. Simplify.

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

$$64h^{30}m^6p^{54}$$

4. Simplify.

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

$$1$$

5. Simplify.

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

$$\frac{st^3f^{11}u^{11}}{f^{15}}$$

6. Simplify.

$$\sqrt{300}$$

$$\sqrt{100} \cdot \sqrt{3} = 10\sqrt{3}$$

7. Simplify.

$$\sqrt{192}$$

$$\sqrt{81} \cdot \sqrt{2} = 9\sqrt{2}$$

8. Simplify.

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

$$2\sqrt{3}b^4c^3\sqrt{c}$$

9. Rationalize the denominator.

$$\frac{4}{\sqrt{12}} \cdot \frac{\sqrt{12}}{\sqrt{12}} = \frac{4\sqrt{12}}{12} = \frac{4(2\sqrt{3})}{12} = \frac{8\sqrt{3}}{12} = \frac{2\sqrt{3}}{3}$$

10. Simplify.

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

$$-6\sqrt{3} + 3\sqrt{5}$$

11. Simplify.

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

$$12(3) + 30\sqrt{21}$$

$$36 + 30\sqrt{21}$$

12. Solve.

$$6^x = 46656$$

$$6^x = 6^6$$

$$x = 6$$

$$\frac{\log(46656)}{\log(6)} = 6$$

13. Solve.

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

$$3^{2x+1} = 3^5$$

$$2x+1 = 5$$

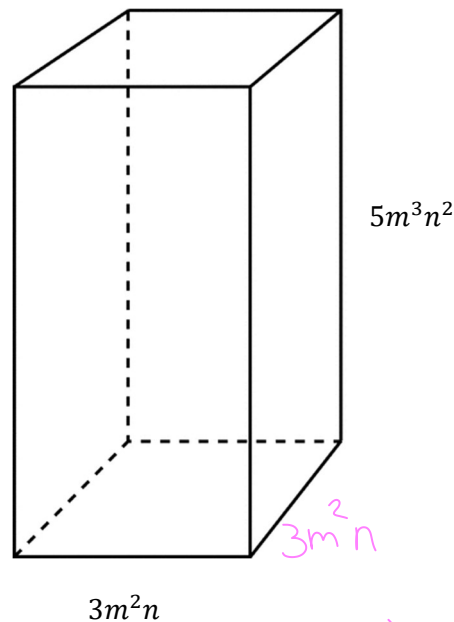
$$2x = 4$$

$$x = 2$$

$$\frac{\log(243)}{\log(3)} = 5$$

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.



$$(3m^2n)^2 = 9m^4n^2 (5m^3n^2)$$

$$45m^7n^4$$