

Algebra I

Review 7.1 - 7.3

Name _____

Simplify the expression. Write your answer using exponents.

- $5^4 \cdot 5^8$
- $(-4)^7 \cdot (-4)^3$
- $(-10)^5 \cdot (-10)^2$
- $8^2 \cdot 8^4 \cdot 8$
- $2^5 \cdot 2 \cdot 2^4$
- $(3^5)^2$
- $(9^3)^7$
- $(15^2)^4$
- $[(-4)^5]^9$
- $(13 \cdot 19)^4$
- $(48 \cdot 27)^6$
- $(135 \cdot 8)^5$

Simplify the expression.

- $x^5 \cdot x^2$
- $y^3 \cdot y \cdot y^4$
- $a^{10} \cdot a^2 \cdot a^6$
- $(z^5)^5$
- $(b^7)^2$
- $[(b + 1)^2]^3$
- $(-3x)^4$
- $-(3x)^4$
- $(2ab)^5$
- $(2x^3y)^6$
- $(3m^7)^4 \cdot m^3$
- $4p^2 \cdot (3p^5)^2$

Find the missing exponent.

- $x^6 \cdot x^2 = x^{12}$
- $(x^4)^? = x^{12}$
- $(3z^2)^3 = 27z^{18}$

- 28. Newspaper Circulation** In 1996, the newspaper circulation in the country of Algeria was approximately 10^3 times the newspaper circulation in the country of Mauritania. The newspaper circulation in Mauritania was 10^3 . What was the newspaper circulation in Algeria?

Simplify the expression. Write your answer using exponents.

1. $\frac{6^{14}}{6^8}$

2. $\frac{14^5}{14^4}$

3. $\frac{(-5)^7}{(-5)^2}$

4. $\frac{12^5 \cdot 12^3}{12^4}$

5. $\frac{8^{17}}{8^3 \cdot 8^7}$

6. $\left(\frac{3}{4}\right)^5$

7. $\left(-\frac{1}{5}\right)^6$

8. $3^8 \cdot \frac{1}{3^1}$

9. $\left(\frac{1}{4}\right)^5 \cdot 4^{13}$

Simplify the expression.

10. $\frac{1}{y^9} \cdot y^{15}$

11. $z^{16} \cdot \frac{1}{z^7}$

12. $\left(\frac{a}{b}\right)^8$

13. $\left(-\frac{6}{z}\right)^3$

14. $\left(\frac{a^3}{2b^5}\right)^4$

15. $\left(\frac{3x^4}{y^6}\right)^5$

16. $\left(\frac{m^4}{5n^9}\right)^3$

17. $\left(\frac{3x^7}{2y^{12}}\right)^4$

18. $\left(\frac{2m^5}{3n^9}\right)^5$

19. **Area** The area of New Zealand is 104,454 square miles and the area of Saint Kitts and Nevis, islands in the Caribbean Sea, is 104 square miles. Use order of magnitude to estimate how many times greater New Zealand's area is than Saint Kitts and Nevis' area.
20. **Cell Phone Subscribers** The table below shows the approximate number of cell phone subscribers in selected countries in 2001.

Country	Algeria	Dominican Republic	Poland	Solomon Islands
Number of subscribers	10^5	10^6	10^7	10^3

- a. How many times greater is the number of cell phone subscribers in Poland than in the Solomon Islands?
- b. How many times greater is the number of cell phone subscribers in the Dominican Republic than in the Solomon Islands?

Evaluate the expression.

- | | | |
|------------------------------------|---------------------------------|---------------------------------|
| 1. 3^{-5} | 2. 10^{-3} | 3. $(-2)^{-6}$ |
| 4. 5^0 | 5. $(-6)^0$ | 6. $\left(\frac{4}{3}\right)^0$ |
| 7. $\left(\frac{5}{8}\right)^{-2}$ | 8. $\left(\frac{7}{4}\right)^3$ | 9. 0^{-5} |
| 10. $10^{-2} \cdot 10^{-3}$ | 11. $4^{-6} \cdot 4^3$ | 12. $\frac{1}{5^{-4}}$ |

Simplify the expression. Write your answer using only positive exponents.

- | | | |
|--------------------------|---------------------------|-------------------------------|
| 13. x^{-7} | 14. $6y^{-4}$ | 15. $(2b)^{-5}$ |
| 16. $(-3m)^{-4}$ | 17. a^2b^{-4} | 18. $3x^{-2}y^{-5}$ |
| 19. $(4x^{-4}y^2)^{-3}$ | 20. $(8mn^3)^0$ | 21. $\frac{c^{-3}}{d^{-5}}$ |
| 22. $\frac{x^2}{y^{-4}}$ | 23. $\frac{x^{-6}}{4y^5}$ | 24. $\frac{1}{3x^{-3}y^{-7}}$ |

25. **Paper** A sheet of 67-pound paper has a thickness of 100^{-1} inch.
- Write and evaluate an expression for the total thickness of 5 sheets of 67-pound paper.
 - Write and evaluate an expression for the total thickness of 2^3 sheets of 67-pound paper.
26. **Frogs** A frog egg currently has a radius of 5^{-1} centimeter. Write an expression for the volume of the frog egg. Use the formula for the volume of a sphere $V = \frac{4}{3}\pi r^3$.

