

Monomials and Polynomials Review**Simplify. Leave your answer in exponential form.**

D 1. $8^1 \times 8^6 = 8^{1+6} = 8^7$

a. 8^6 b. 64^7 c. 8^5 d. 8^7

Simplify:

A 2. $(wc^7)(-8w^3c^5) = -8w^4c^{12}$

a. $-8w^4c^{12}$ c. $-8w^4c^{11}$
 b. $-8w^3c^{12}$ d. $-8w^3c^{11}$

A 3. $(-3c^8)(2c^6d^8) = -6c^{14}d^8$

a. $-6c^{14}d^8$ c. $6c^{48}d^{14}$
 b. $-6c^{48}d^8$ d. $6c^{14}d^{14}$

A 4. $(c^8)^4$

a. c^{32} b. c^{12} c. c^2 d. c^4

B 5. $6^4 \times 6^5$

a. 6^{20} b. 6^9 c. 36^{20} d. 36^9

6. $d^1 \cdot d^9 \cdot d^6 = d^{1+9+6} = d^{16}$

7. $(3c^2)(-3c^2d^2) = -9c^4d^2$

Simplify. Write your answer using exponents.

D 8. $(2^2)^6$

a. 2^{13} b. 2^{64} c. 2^8 d. 2^{12}

D 9. $(2qr^5)^3(qr)^6$ $2^3 q^3 r^{15} \cdot 8 q^6 r^6 = 8 q^9 r^{21}$

a. $2q^9 r^{21}$ c. $8q^9 r^{11}$
 b. $2q^4 r^{21}$ d. $8q^9 r^{21}$

10. Simplify: $(2v)^2$ $2^2 v^2 = 4v^2$

11. Simplify $(8x^3)^2(2x^2)^3$.
 $8^2 x^6 \cdot 2^3 x^6 = 64x^6 \cdot 8x^6 = 512x^{12}$

12. Simplify $(-x)^2(-x^2)^2(-x^3)$.
 $x^2 \cdot x^4 \cdot -x^3 = -x^9$

Simplify the expression using positive exponents.

A 13. $\left(\frac{x^3}{y^8}\right)^4$ $\frac{x^{12}}{y^{32}}$

a. $\frac{x^{12}}{y^{32}}$ c. $x^{12} + y^{32}$
 b. $\frac{x^7}{y^{12}}$ d. $\frac{x^{12}}{y^8}$

14. Evaluate the expression $\frac{5^4 \cdot 5^5}{5^6}$. $= \frac{5^9}{5^6} = 5^3 = 125$

15. About 10^4 taxpayers live in City A. Last year, the state collected about 10^7 dollars in taxes from these taxpayers.
- a. On average, how much did each taxpayer in City A pay in taxes last year?
 b. City B has 10^6 taxpayers and collected 10^8 dollars in taxes. On average, did a resident of City B pay more or less than a resident of City A in taxes? Explain.

A \$1000 B. They paid less.

$\frac{10^7}{10^4} = 10^3$ $\frac{10^8}{10^6} = 10^2 = 100$

Simplify:

A 16. $a^{-11} \cdot a^{-11} = a^{-22} = \frac{1}{a^{22}}$

a. $\frac{1}{a^{22}}$ b. a^{22} c. -22^a d. $\frac{1}{a^{-22}}$

B 17. Write $5^0 \cdot 5^{-12}$ using positive exponents. $5^0 \cdot 5^{-12} = 5^{-12} = \frac{1}{5^{12}}$

a. $\frac{1}{5^{13}}$

b. $\frac{1}{5^{12}}$

c. 5^{12}

d. 5^0

18. Rewrite using only positive exponents: $3a^2b^{-2}c^{-3}$

$$\frac{3a^2}{b^2c^3}$$

19. Rewrite the expression using positive exponents. $(-2)^0(3x^{-2}y^{-2})^{-1}$

$$1 = 3^{-1}x^2y^2 = \frac{x^2y^2}{3}$$

A 20. Classify the expression $-9v^9 - 7$ and state its degree.

a. binomial, 9

c. trinomial, 9

b. binomial, 10

d. trinomial, 10

Simplify the expression.

A 21. $(5q^5 + 4) - (2q^3 + 9) + (6q^5 - q^3)$

a. $11q^5 - 3q^3 - 5$

c. $11q^3 + 3q^5 + 5$

b. $-3q^5 + 11q^3 - 5$

d. $11q^5 + 3q^3 + 5$

22. $(3e^4 - 4) - (8e^3 + 2) + (4e^4 + 3e^3)$

$$\begin{array}{r} 4 \quad -8e-2 \\ 7e-5e^3-6 \end{array}$$

Find the difference.

A 23. $(-4z^4 - 4z^3 - 6) - (-6z^4 - 7z^3 - 3)$

a. $2z^4 + 3z^3 - 3$

c. $10z^4 + 11z^3 + 9$

b. $-10z^4 - 11z^3 - 9$

d. $-2z^4 - 3z^3 + 3$

24. $(-7q^5 - 8q^4 + 6q^3 - 6q^2) - (-6q^4 + 2q^3 - 2q^2)$

$$-7q^5 - 8q^4 + 6q^3 - 6q^2 + 6q^4 - 2q^3 + 2q^2 = -7q^5 - 2q^4 + 4q^3 - 4q^2$$

25. Write the polynomial so that the exponents decrease from left to right. $-4x^2 - 3x - 3x^4 - 2$

$$-3x^4 - 4x^2 - 3x - 2$$

26. Find the sum $(2x^2 - 7x + 7) + (-3x^2 - 2x + 8)$.

$$-x^2 - 9x + 15$$

27. Find the sum $(5x^4 - 5x^6 - 5) + (9x^6 - 7 - 3x^4)$.

$$4x^6 + 2x^4 - 12$$

28. Find the difference $(3z^3 + 2z^2 + 7) - (z^3 - 3z - 6)$.

$$3z^3 + 2z^2 + 7 - z^3 + 3z + 6 = 2z^3 + 2z^2 + 3z + 13$$

29. Find the difference $(3x^3 - 7x - 5) - (x^3 - 2x^2 + 4)$.

$$3x^3 - 7x - 5 - x^3 + 2x^2 - 4 = 2x^3 + 2x^2 - 7x - 9$$

Find the product.

C 30. $(x+4)(x+7)$

a. $x^2 + 28$

b. $x^2 + 28x + 11$

c. $x^2 + 11x + 28$

d. $x^2 + 28x + 28$

A 31. $(x+5)(x^2 - 2x + 3)$

a. $x^3 + 3x^2 - 7x + 15$

b. $x^3 - 2x^2 + 15$

c. $x^3 + 3x^2 - 10x + 15$

d. $x^2 - 3x + 15$

A 32. $(x+7)(x^2 - 4x + 2)$

a. $x^3 + 3x^2 - 26x + 14$

b. $x^3 + 11x^2 - 26x + 14$

c. $x^3 + 3x^2 - 30x + 14$

d. $x^3 + 11x^2 - 30x + 14$

33. $17x(3x-5)$

$$51x^2 - 85x$$

34. $3x^2(4-x^2)$

$$12x^2 - 3x^4 = -3x^4 + 12x^2$$

35. $-3x^2(2x^2 - 5x - 3)$

$$-6x^4 + 15x^3 + 9x^2$$

36. $-x^2(-3x^2 + 2x - 4)$

$$3x^4 - 2x^3 + 4x^2$$

37. Use the FOIL pattern to find the product $(2x - 5)(3x + 4)$.

$$6x^2 + 8x - 15x - 20 = 6x^2 - 7x - 20$$

38. A rectangle has length $x + 5$ and width $x - 7$. Write an equation that represents the area, A , of the rectangle in terms of x .

$$(x + 5)(x - 7) = x^2 - 7x + 5x - 35 = x^2 - 2x - 35$$

Find the product.

39. $(a - 7)^2$ $(a - 7)(a - 7) = a^2 - 7a - 7a + 49 = a^2 - 14a + 49$

40. $(2p + 7)(2p - 7)$
 $4p^2 - 14p + 14p - 49 = 4p^2 - 49$

41. $(4x + 7y)^2$ $(4x + 7y)(4x + 7y) = 16x^2 + 28xy + 28xy + 49y^2 = 16x^2 + 56xy + 49y^2$

Find the missing term.

A 42. $(x + 9)^2 = x^2 + 18x + \underline{\quad}$

- a. 81
- b. 27
- c. 72
- d. 90

43. $(x - 2)(x - 4) = 0$
 $x - 2 = 0 \Rightarrow x = 2$
 $x - 4 = 0 \Rightarrow x = 4$

44. Consider the equation $(3t - 15)(4t + 22) = 0$.

- a. Solve the equation.
- b. Susan noticed that she could factor out a 3 from the first expression on the left side of the equation and a 2 from the second expression. She rewrote the equation as $3(t - 5) \cdot 2(t + 11) = 0$. Is this equation equivalent to the original equation? Explain.

$$\begin{array}{r} 3t - 15 = 0 \\ +15 +15 \\ \hline 3t = 15 \\ \frac{3t}{3} = \frac{15}{3} \\ t = 5 \end{array}$$

$$\begin{array}{r} 4t + 22 = 0 \\ -22 -22 \\ \hline 4t = -22 \\ \frac{4t}{4} = \frac{-22}{4} \\ t = -\frac{11}{2} \end{array}$$

Not Necessary

