

6-1 Skills Practice**Properties of Exponents**

Simplify. Assume that no variable equals 0.

1. $b^4 \cdot b^3$ b^7

2. $c^5 \cdot c^2 \cdot c^2$ c^9

3. $a^{-4} \cdot a^{-3}$ $a^{-7} = \frac{1}{a^7}$

4. $x^5 \cdot x^{-4} \cdot x$ x^2

5. $(g^4)^2$ g^8

6. $(3u)^3$ $27u^3$

7. $(-x)^4$ x^4

8. $-5(2z)^3$ $-5(8z^3) = -40z^3$

9. $-(-3d)^4$ $-81d^4$

10. $(-2t^2)^3$ $-8t^6$

11. $(-r^7)^3$ $-r^{21}$

12. $\frac{s^{15}}{s^{12}}$ s^3

13. $\frac{k^9}{k^{10}}$ $\frac{1}{k}$

14. $(-3f^3g)^3$ $-27f^9g^3$

15. $(2x)^2(4y)^2$
 $(4x^2)(16y^2) = 64x^2y^2$

16. $-2gh(g^3h^5)$ $-2g^4h^6$

17. $10x^2y^3(10xy^8)$ $100x^3y^{11}$

18. $\frac{24wz^7}{3w^3z^5}$ $\frac{8z^2}{w^2}$

19. $\frac{-6a^4bc^8}{36a^7b^2c}$ $= \frac{-1c^7}{6a^3b}$

20. $\frac{-10pq^4r}{-5p^3q^2r}$ $\frac{2q^2}{p^2}$

Express each number in scientific notation.

21. 53,000 5.3×10^4

22. 0.000248 2.48×10^{-4}

23. 410,100,000 4.101×10^8

24. 0.00000805 8.05×10^{-6}

Evaluate. Express the result in scientific notation.

25. $(4 \times 10^3)(1.6 \times 10^{-6})$
 6.4×10^{-3}

26. $\frac{9.6 \times 10^7}{1.5 \times 10^{-3}}$ 6.4×10^{10}

6-2 Skills Practice

Operations with Polynomials

Determine whether each expression is a polynomial. If it is a polynomial, state the degree of the polynomial.

1. $x^2 + 2x + 2$

2

2. $\frac{b^2c}{d^4}$

not poly.

3. $8xz + \frac{1}{2}y$

2

Simplify.

4. $(g + 5) + (2g + 7)$

$3g + 12$

5. $(5d + 5) - (d + 1)$

$5d + 5 - d - 1$
 $4d + 4$

6. $(x^2 - 3x - 3) + (2x^2 + 7x - 2)$

$3x^2 + 4x - 5$

7. $(-2f^2 - 3f - 5) + (-2f^2 - 3f + 8)$

$-4f^2 - 6f + 3$

8. $(4r^2 - 6r + 2) + (r^2 + 3r + 5)$

$5r^2 - 3r + 7$

9. $(2x^2 - 3xy) + (3x^2 + 6xy + 4y^2)$

$5x^2 + 3xy + 4y^2$

10. $(5t - 7) + (2t^2 + 3t + 12)$

$2t^2 + 8t + 5$

11. $(u - 4) + (6 + 3u^2 + 4u)$

$3u^2 + 5u - 10$

12. $-5(2c^2 - d^2)$

$-10c^2 + 5d^2$

13. $x^2(2x + 9)$

$2x^3 + 9x^2$

14. $2q(3pq + 4q^4)$

$6pq^2 + 8q^5$

15. $8w(hk^2 + 10h^3m^4 - 6k^5w^3)$

$8hk^2w + 80h^3m^4w - 48k^5w^4$

16. $m^2n^3(-4m^2n^2 - 2mnp - 7)$

$-4m^4n^5 - 2m^3n^4p - 7m^2n^3$

17. $-3s^2y(-2s^4y^2 + 3sy^3 + 4)$

$6s^6y^3 - 9s^3y^4 - 12s^2y$

18. $(c + 2)(c + 8)$

$c^2 + 10c + 16$

19. $(z - 7)(z + 4)$

$z^2 + 4z - 7z - 28$

$z^2 - 3z - 28$

20. $(a - 5)^2$

$(a - 5)(a - 5)$

$a^2 - 10a + 25$

21. $(2x - 3)(3x - 5)$

$6x^2 - 10x - 9x + 15$

$6x^2 - 19x + 15$

22. $(r - 2s)(r + 2s)$

$r^2 - 4s^2$

23. $(3y + 4)(2y - 3)$

$6y^2 - 9y + 8y - 12$

$6y^2 - y - 12$

24. $(3 - 2b)(3 + 2b)$

$9 - 4b^2$

25. $(3w + 1)^2$

$(3w + 1)(3w + 1)$

$9w^2 + 6w + 1$