NAME Key DATE _____ PERIOD _____

5-1 Skills Practice

Monomials

1-20

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

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

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. $(2x)^2(4y)^2$ $64x^2y^2$

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

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

Lesson 5-1

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5-2 Skills Practice

Polynomials

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

1. $x^2 + 2x + 2$ yes; 2
2. $\frac{b^2c}{d^4}$ no
3. $8xz + \frac{1}{2}y$ yes; 2

Simplify.

4. $(g + 5) + (2g + 7)$
$3g+12$
5. $(5d + 5) - (d + 1)$
$4d+4$
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. $(4r^2 - 6r + 2) - (-r^2 + 3r + 5)$
$5r^2-9r-3$
9. $(2x^2 - 3xy) - (3x^2 - 6xy - 4y^2)$
$-x^2+3xy+4y^2$
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. $(z - 7)(z + 4)$
$z^2-3z-28$
20. $(a - 5)^2$
$a^2-10a+25$
21. $(2x - 3)(3x - 5)$
$6x^2-19x+15$
22. $(r - 2s)(r + 2s)$
r^2-4s^2
23. $(3y + 4)(2y - 3)$
$6y^2-y-12$
24. $(3 - 2b)(3 + 2b)$
$9-4b^2$
25. $(3w + 1)^2$
$9w^2+6w+1$

Lesson 5-2

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5-3 Skills Practice

Dividing Polynomials

Simplify.

1. $\frac{10c + 6}{2}$ $5c + 3$

2. $\frac{12x + 20}{4}$ $3x + 5$

3. $\frac{15y^3 + 6y^2 + 3y}{3y}$ $5y^2 + 2y + 1$

4. $\frac{12x^2 - 4x - 8}{4x}$ $3x - 1 - \frac{2}{x}$

5. $(15q^6 + 5q^2)(5q^4)^{-1}$ $3q^2 + \frac{1}{q^2}$

6. $(4f^5 - 6f^4 + 12f^3 - 8f^2)(4f^2)^{-1}$ $f^3 - \frac{3f^2}{2} + 3f - 2$

7. $(6j^2k - 9jk^2) \div 3jk$ $2j - 3k$

8. $(4a^2h^2 - 8a^3h + 3a^4) \div (2a^2)$ $2h^2 - 4ah + \frac{3a^2}{2}$

9. $(n^2 + 7n + 10) \div (n + 5)$ $n + 2$

10. $(d^2 + 4d + 3) \div (d + 1)$ $d + 3$

11. $(2s^2 + 13s + 15) \div (s + 5)$ $2s + 3$

12. $(6y^2 + y - 2)(2y - 1)^{-1}$ $3y + 2$

13. $(4g^2 - 9) \div (2g + 3)$ $2g - 3$

14. $(2x^2 - 5x - 4) \div (x - 3)$ $2x + 1 - \frac{1}{x-3}$

15. $\frac{u^2 + 5u - 12}{u - 3}$ $u + 8 + \frac{12}{u-3}$

16. $\frac{2x^2 - 5x - 4}{x - 3}$ $3l^3 - 8l^2 - 5$

17. $(3v^2 - 7v - 10)(v - 4)^{-1}$ $3v + 5 + \frac{10}{v-4}$

18. $(3t^4 + 4t^3 - 32t^2 - 5t - 20)(t + 4)^{-1}$ $2x^2 + 5x - 4 + \frac{3}{x-3}$

19. $\frac{y^3 - y^2 - 6}{y + 2}$ $y^2 - 3y + 6 - \frac{18}{y+2}$

20. $\frac{2x^3 - x^2 - 19x + 15}{x - 3}$ $2x^2 + 5x - 4 + \frac{3}{x-3}$

21. $(4p^3 - 3p^2 + 2p) \div (p - 1)$ $4p^2 + p + 3 + \frac{3}{p-1}$

22. $(3c^4 + 6c^3 - 2c + 4)(c + 2)^{-1}$ $3c^3 - 2 + \frac{8}{c+2}$

23. **GEOMETRY** The area of a rectangle is $x^3 + 8x^2 + 13x - 12$ square units. The width of the rectangle is $x + 4$ units. What is the length of the rectangle? $x^2 + 4x - 3$

Lesson 5-3