NAME Key CLASS _____ DATE _____

Practice

8.1 Laws of Exponents: Multiplying Monomials

Find the value of each expression.

1. 5^5 3125
2. 2^9 512
3. 6^3 216
4. 9^3 729
5. 100^2 10,000
6. 6^5 7,776
7. 10^7 10,000,000
8. 3^3 27
9. 4^8 65,536
10. 12^4 20,736
11. 16^2 256
12. 20^4 160,000

Simplify each product.

13. $10^2 \cdot 10^5$ 10^7
14. $a^7 \cdot a^{12}$ a^{19}
15. $c^3 \cdot c^8$ c^{11}
16. $d^7 \cdot d^9$ d^{16}
17. $x^2 \cdot x^8$ x^{10}
18. $w^3 \cdot w^5$ w^8
19. $a^2 \cdot a^6$ a^8
20. $10^a \cdot 10^b$ 10^{a+b}

Simplify each product.

21. $(2x^2)(4x^3y^2)$ $8x^5y^2$
22. $(-3a^2b)(6ab^4c)$ $-18a^3b^5c$
23. $(7q^5)(12q^3r^5)$ $84q^8r^5$
24. $(11c^8)(-10c^4d)$ $-110c^{12}d$
25. $(9x^{10}z^2)(5x^5y^3)$ $45x^{15}y^3z^2$
26. $(-8f^6g)(-7f^2g^5h)$ $56f^8g^6h$
27. $(1.3a^6b^{11}c^5)(0.5a^2bc^3)$ $.65a^8b^{12}c^8$
28. $(4.7r^6s^2)(2.1r^{11}s)$ $9.87r^{17}s^3$
29. $(-2x^2z)(-2y^2z)(-2xyz)$ $-8x^3y^3z^3$
30. $(a^xb^yc^z)(a^rb^sc^t)$ $a^{x+r}b^{y+s}c^{z+t}$

The area, A, of a triangle is given by $A = \frac{1}{2}bh$, where b is the base and h is the height. Find the area of the triangle given the values of b and h.

31. $h = 5x, b = 2x$ $A = 5x^2$
32. $h = x^3, b = x^4$ $A = \frac{1}{2}x^7$ or $\frac{x^7}{2}$
33. $h = 3x^4, b = 4x^7$ $A = 6x^{11}$
34. $h = 12a^3, b = 10a^2$ $A = 60a^5$

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Practice

8.2 Laws of Exponents: Powers and Products

Simplify each expression.

1. $(4y)^2$ $16y^2$
2. $(5^2)^3$ $15{,}625$
3. $(-y^5)^4$ y^{20}
4. $(a^2)^5$ a^{10}
5. $(y^2)^3$ y^6
6. $(w^2)^2$ w^4
7. $(w^4)^6$ w^{24}
8. $(-8c^5)^2$ $64c^{10}$
9. $(-3h^9)^3$ $-27h^{27}$
10. $(-y^4d^6)^8$ $y^{32}d^{48}$
11. $(-c^5h^6)^3$ $-c^{15}h^{18}$
12. $(-15h^9k^7)^2$ $225h^{18}k^{14}$
13. $(k^9)^5(k^3)^2$ $k^{45} \cdot k^6 = k^{51}$
14. $(3y^6)^2(x^5y^2z)$ $9y^{12}(x^5y^2z) = 9x^5y^{14}z$
15. $(4h^3)^2(-2g^3h)^3$ $-128g^9h^9$ $16h^6(-8g^9h^3)$
16. $(14a^4b^6)^2(a^6b^3)^7$ $196a^8b^{12}(a^{42}b^{21})$ $196a^{50}b^{33}$

Evaluate each monomial for $x = 5$, $y = -1$, and $z = -4$.

17. y^4 1
18. $3x^3$ 375
19. $2y^2$ 2
20. z^2 16
21. $(yz)^2$ 16
22. $(yx)^2$ 25
23. x^2z^2 400
24. y^x -1
25. $-(y^x)$ 1

26. What is the area of a square if each edge of the square has a length of $3a^5$?

$(3a^5)^2 = 9a^{10}$

27. What is the area of a rectangle if one side has a length of $12x^3$ and the other side has a length of $6x^2$?

$12x^3(6x^2) = 72x^5$

Find the volume of the cube for each edge length, *e*.

28. $e = 5y^4$ $(5y^4)^3 = 125y^{12}$
29. $e = 3x^7y^5$ $(3x^7y^5)^3 = 27x^{21}y^{15}$