

## EXERCISES

Write each product (expression) using exponents.

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|---------------------------|------------------------|---------------------------------|--|--|
| 1. $10 \cdot 10 \cdot 10$ | 2. $9 \cdot 9$         | 3. $7 \cdot 7 \cdot 7 \cdot 7$  | 4. $4 \cdot 4 \cdot 4 \cdot 4$         | 5. $1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 \cdot 1$ |
| 6. $a \cdot a$            | 7. $p \cdot p \cdot p$ | 8. $x \cdot x \cdot x \cdot x$  | 9. $x \cdot x \cdot y \cdot y \cdot y$ | 10. $x \cdot y \cdot x \cdot y \cdot x$                |
| 11. 8 cubed               | 12. 8 squared          | 13. $a \cdot a \cdot 5 \cdot 5$ | 14. $y \cdot y \cdot -a \cdot -a$      | 15. 9 to the fifth power                               |
| 16. $-3 \cdot -3$         | 17. $-3 \cdot 3$       | 18. $-6 \cdot -6 \cdot -6$      | 19. $-x \cdot x \cdot -y \cdot -y$     | 20. $-a \cdot -a \cdot -a \cdot 2y$                    |

Write each power (expression) as a product of the same factor.

- |                |              |            |              |                          |
|----------------|--------------|------------|--------------|--------------------------|
| 21. $1^5$      | 22. $3^4$    | 23. $4^3$  | 24. $6^4$    | 25. $4^6$                |
| 26. 10 squared | 27. 10 cubed | 28. $a^3$  | 29. $p^4$    | 30. 3 to the sixth power |
| 31. $(-4)^3$   | 32. $-4^3$   | 33. $-3^4$ | 34. $(-3)^4$ | 35. $-10^4$              |
| 36. $-a^3$     | 37. $(-a)^3$ | 38. $3x^3$ | 39. $(3x)^3$ | 40. $-(3x)^2$            |

Evaluate each exponent (power).

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|-----------------|-----------------|-----------------|-----------------|-----------------|
| 41. $5^3$       | 42. $3^5$       | 43. $2^5$       | 44. $5^2$       | 45. $4^3$       |
| 46. 9 squared   | 47. 9 cubed     | 48. $1^5$       | 49. $1^9$       | 50. $3^4$       |
| 51. $(-2)^3$    | 52. $(-2)^6$    | 53. $-2^3$      | 54. $(-6)^3$    | 55. $-6^2$      |
| 56. $(-1)^{20}$ | 57. $(-1)^{25}$ | 58. $(-1)^{15}$ | 59. $(-a)^{16}$ | 60. $(-a)^{73}$ |
| 61. $7^0$       | 62. $10^0$      | 63. $99^0$      | 64. $0^0$       | 65. $1^0$       |

Evaluate each expression if  $a = -3$ ,  $b = 2$ ,  $c = 4$ ,  $d = -2$ .

- |            |              |             |               |               |
|------------|--------------|-------------|---------------|---------------|
| 66. $a^3$  | 67. $d^2$    | 68. $b^4$   | 69. $2b^3$    | 70. $4a^2$    |
| 71. $abc$  | 72. $4d^3$   | 73. $6a^4d$ | 74. $3ad^3$   | 75. $(4a)^2$  |
| 76. $2d^3$ | 77. $(2d)^3$ | 78. $-4c^2$ | 79. $-(4c)^2$ | 80. $(-4c)^2$ |

81. The area of a square is given by the formula  $A = s^2$  (where  $s$  is the length of one side). Find the area of a square with one side 12 meters.
82. The volume of a cube is given by the formula  $V = s^3$  (where  $s$  is the length of one side). Find the volume of a cube with one side 12 meters.
83. The distance in feet that an object falls in  $t$  seconds is given by the formula  $d = \frac{1}{2}gt^2$  (where  $g = 32$ ). Find the distance of an object falls in 5 seconds.
84. Light travels at the rate of about 200,000 miles per second. Write this number as the product of 2 and a power of 10.
85. The distance from the Earth to the Moon is about 400 million meters. Write this number as the product of 4 and a power of 10.
86. Light travels at the rate of about 200,000 miles per second. It takes 500 seconds for the light from the Sun to reach the Earth. Find the distance from the Sun to the Earth in the form as a the product of 1 and a power of 10.
87. Evaluate: a)  $a^7 \cdot a^5$    b)  $a^7 \div a^5$    c)  $a^7 \div a^7$    d)  $3^{30} \cdot 3^{12}$    e)  $3^{30} \div 3^{12}$    f)  $3^{30} \div 3^{30}$