

7-1 Practice**Multiplying Monomials**

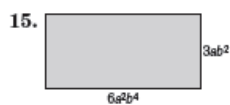
Determine whether each expression is a monomial. Write *yes* or *no*. Explain your reasoning.

- $\frac{21a^2}{7b}$ **No**; this involves the quotient, not the product, of variables.
- $\frac{b^3c^2}{2}$ **Yes**; this is the product of a number, $\frac{1}{2}$, and two variables.

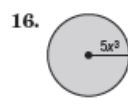
Simplify each expression.

- $(-5x^2y)(3x^4) - 15x^6y$
- $(3ad^4)(-2a^2) - 6a^3d^4$
- $(-15xy^4)\left(-\frac{1}{3}xy^3\right) 5x^2y^7$
- $(-18m^2n)^2\left(-\frac{1}{6}mn^3\right) - 54m^5n^4$
- $\left(\frac{2}{3}p\right)^2 \frac{4}{9}p^2$
- $(0.4k^3)^3 0.064k^9$
- $(2ab^2f^2)(4a^3b^2f^2) 8a^4b^4f^4$
- $(4g^3h)(-2g^5) - 8g^8h$
- $(-xy)^3(xz) - x^4y^3z$
- $(0.2a^2b^3)^2 0.04a^4b^6$
- $\left(\frac{1}{4}ad^3\right)^2 \frac{1}{16}a^2d^6$
- $[(4^2)^2]^2 4^8$ or **65,536**

GEOMETRY Express the area of each figure as a monomial.



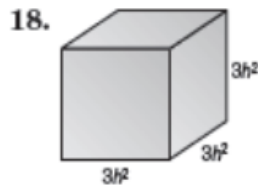
$$18a^3b^6$$



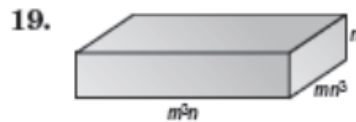
$$(25x^6)\pi$$



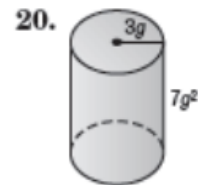
$$12a^3b^4$$



$$27h^6$$



$$m^4n^5$$



$$(63g^4)\pi$$

21. **COUNTING** A panel of four light switches can be set in 2^4 ways. A panel of five light switches can set in twice this many ways. In how many ways can five light switches be set? **2^5 or 32**

7-2 Practice**Dividing Monomials**

Simplify each expression. Assume that no denominator equals zero.

- | | | |
|---|---|---|
| 1. $\frac{8^8}{8^4}$ 8⁴ or 4096 | 2. $\frac{a^4b^6}{ab^3}$ a³b³ | 3. $\frac{xy^2}{xy}$ y |
| 4. $\frac{m^5np}{m^4p}$ mn | 5. $\frac{5c^2d^3}{-4c^2d} - \frac{5d^2}{4}$ | 6. $\frac{8y^7z^6}{4y^6z^6}$ 2yz |
| 7. $\left(\frac{4f^2g}{3h^6}\right)^3$ $\frac{64f^6g^3}{27h^{18}}$ | 8. $\left(\frac{6w^5}{7p^6r^3}\right)^2$ $\frac{36w^{10}}{49p^{12}r^6}$ | 9. $\frac{-4x^2}{24x^5} - \frac{1}{6x^3}$ |
| 10. $x^2(y^{-8})(x^{-8})$ $\frac{1}{x^5y^8}$ | 11. $p(q^{-2})(r^{-3})$ $\frac{p}{q^2r^3}$ | 12. 12^{-2} $\frac{1}{144}$ |
| 13. $\left(\frac{3}{7}\right)^{-2}$ $\frac{49}{9}$ | 14. $\left(\frac{4}{3}\right)^{-4}$ $\frac{81}{256}$ | 15. $\frac{22r^2s^2}{11r^2s^{-3}}$ 2rs⁵ |
| 16. $\frac{-15u^4u^{-1}}{5u^3} - \frac{3}{u^4}$ | 17. $\frac{8c^3d^2f^4}{4c^{-1}d^2f^{-3}}$ 2c⁴f⁷ | 18. $\left(\frac{x^{-3}y^6}{4^{-3}}\right)^0$ 1 |
| 19. $\frac{6f^{-1}g^3h^5}{54f^{-2}g^{-5}h^3}$ $\frac{g^8h^2}{9}$ | 20. $\frac{-12t^{-1}u^5x^{-4}}{2t^{-3}ux^2} - \frac{6t^2u^4}{x^9}$ | 21. $\frac{r^4}{(3r)^3}$ $\frac{r}{27}$ |
| 22. $\frac{m^{-2}n^{-5}}{(m^4n^3)^{-1}}$ $\frac{m^2}{n^2}$ | 23. $\frac{(j^{-1}k^3)^{-4}}{j^5k^8}$ $\frac{j}{k^{15}}$ | 24. $\frac{(2a^{-1}b)^{-3}}{5a^2b^4}$ $\frac{a^4}{40b^7}$ |
| 25. $\left(\frac{q^{-1}r^3}{qr^{-2}}\right)^{-3}$ $\frac{q^{10}}{r^{25}}$ | 26. $\left(\frac{7c^{-3}d^3}{c^5dh^{-4}}\right)^{-1}$ $\frac{c^8}{7d^2h^4}$ | 27. $\left(\frac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$ $\frac{9x^2}{4y^2z^6}$ |

7-3 Practice**Scientific Notation**

Express each number in scientific notation.

- | | |
|---|--|
| 1. 1,900,000
1.9×10^6 | 2. 0.000704
7.04×10^{-4} |
| 3. 50,040,000,000
5.004×10^{10} | 4. 0.0000000661
6.61×10^{-8} |

Express each number in standard form.

- | | |
|---|---|
| 5. 5.3×10^7
53,000,000 | 6. 1.09×10^{-4}
0.000109 |
| 7. 9.13×10^3
9130 | 8. 7.902×10^{-6}
0.000007902 |

Evaluate each product. Express the results in both scientific notation and standard form.

- | | |
|--|---|
| 9. $(4.8 \times 10^4)(6 \times 10^6)$
2.88×10^{11}; 288,000,000,000 | 10. $(7.5 \times 10^{-9})(3.2 \times 10^7)$
2.4×10^3; 2400 |
| 11. $(2.06 \times 10^4)(5.5 \times 10^{-9})$
1.133×10^{-4}; 0.0001133 | 12. $(8.1 \times 10^{-6})(1.96 \times 10^{11})$
1.5876×10^6; 1,587,600 |
| 13. $(5.29 \times 10^6)(9.7 \times 10^4)$
5.1313×10^{13}; 51,313,000,000,000 | 14. $(1.45 \times 10^{-5})(7.2 \times 10^{-5})$
1.044×10^{-10}; 0.0000000001044 |

Evaluate each quotient. Express the results in both scientific notation and standard form.

- | | |
|--|--|
| 15. $\frac{4.2 \times 10^5}{(3 \times 10^{-5})}$
1.4×10^9; 140,000,000 | 16. $\frac{(1.76 \times 10^{-11})}{(2.2 \times 10^{-5})}$
8×10^{-7}; 0.0000008 |
| 17. $\frac{(7.05 \times 10^{12})}{(9.4 \times 10^7)}$
7.5×10^4; 75,000 | 18. $\frac{(2.04 \times 10^{-4})}{(3.4 \times 10^5)}$
6×10^{-10}; 0.0000000006 |