NAME _____ DATE _____ PERIOD _____

8-1 Skills Practice

Multiplying Monomials

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

1. 11

2. $a - b$

3. $\frac{p^2}{q^2}$

4. y

5. j^3k

6. $2a + 3b$

Simplify.

7. $a^2(a^3)(a^6)$

8. $x(x^2)(x^7)$

9. $(y^2z)(yz^2)$

10. $(\ell^2k^2)(\ell^3k)$

11. $(e^2f^4)(e^2f^2)$

12. $(cd^2)(c^3d^2)$

13. $(2x^2)(3x^5)$

14. $(5a^7)(4a^2)$

15. $(4xy^3)(3x^3y^5)$

16. $(7a^5b^2)(a^2b^3)$

17. $(-5m^3)(3m^8)$

18. $(-2c^4d)(-4cd)$

19. $(10^2)^3$

20. $(p^3)^{12}$

21. $(-6p)^2$

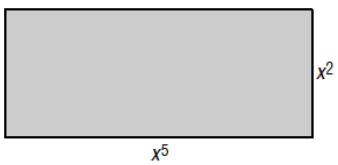
22. $(-3y)^3$

23. $(3pq^2)^2$

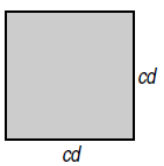
24. $(2b^3c^4)^2$

GEOMETRY Express the area of each figure as a monomial.

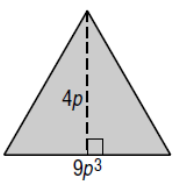
25.



26.



27.



NAME _____ DATE _____ PERIOD _____

8-1 Practice

Multiplying Monomials

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

1. $\frac{21a^2}{7b}$

2. $\frac{b^3c^2}{2}$

Simplify.

3. $(-5x^2y)(3x^4)$

4. $(2ab^2c^2)(4a^3b^2c^2)$

5. $(3cd^4)(-2c^2)$

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

7. $(-15xy^4)\left(-\frac{1}{3}xy^3\right)$

8. $(-xy)^3(xz)$

9. $(-18m^2n)^2\left(-\frac{1}{6}mn^2\right)$

10. $(0.2a^2b^3)^2$

11. $\left(\frac{2}{3}p\right)^2$

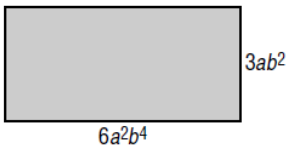
12. $\left(\frac{1}{4}cd^3\right)^2$

13. $(0.4k^3)^3$

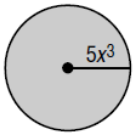
14. $[(4^2)^2]^2$

GEOMETRY Express the area of each figure as a monomial.

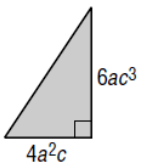
15.



16.

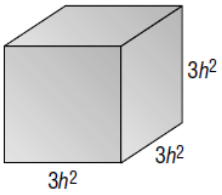


17.

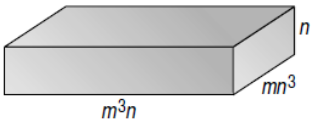


GEOMETRY Express the volume of each solid as a monomial.

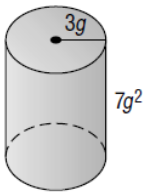
18.



19.



20.



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?

22. HOBBIES Tawa wants to increase her rock collection by a power of three this year and then increase it again by a power of two next year. If she has 2 rocks now, how many rocks will she have after the second year?

NAME _____ DATE _____ PERIOD ____

8-1

Skills Practice

Multiplying Monomials

etermine whether each expression is a monomial. Write *yes* or *no*. Explain.

1. 11 Yes; 11 is a real number and an example of a constant.
2. $a - b$ No; This is the difference, not the product, of two variables.
3. $\frac{p^2}{q^2}$ No; This is the quotient, not the product, of two variables.
4. y Yes; Single variables are monomials.
5. j^3k Yes; This is the product of two variables.
6. $2a + 3b$ No; This is the sum of two monomials.

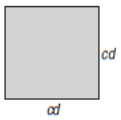
implify.

7. $a^2(a^3)(a^6)$ a^{11}
8. $x(x^2)(x^7)$ x^{10}
9. $(y^2z)(yz^2)$ y^3z^3
10. $(\ell^2k^2)(\ell^3k)$ ℓ^5k^3
11. $(e^2f^4)(e^2f^2)$ e^4f^6
12. $(cd^2)(c^3d^2)$ c^4d^4
13. $(2x^2)(3x^5)$ $6x^7$
14. $(5a^7)(4a^2)$ $20a^9$
15. $(4xy^3)(3x^3y^5)$ $12x^4y^8$
16. $(7a^5b^2)(a^2b^3)$ $7a^7b^5$
17. $(-5m^3)(3m^8)$ $-15m^{11}$
18. $(-2c^4d)(-4cd)$ $8c^5d^2$
19. $(10^2)^3$ 10^6 or 1,000,000
20. $(p^3)^{12}$ p^{36}
21. $(-6p)^2$ $36p^2$
22. $(-3y)^3$ $-27y^3$
23. $(3pq^2)^2$ $9p^2q^4$
24. $(2b^3c^4)^2$ $4b^6c^8$

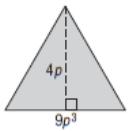
EOMETRY Express the area of each figure as a monomial.

25. 

x^7

26. 

c^2d^2

27. 

$18p^4$

Lesson 8-1

NAME _____ DATE _____ PERIOD ____

8-1

Practice (Average)

Multiplying Monomials

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

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

Simplify.

3. $(-5x^2y)(3x^4)$ $-15x^6y$
4. $(2ab^2c^2)(4a^3b^2c^2)$ $8a^4b^4c^4$
5. $(3cd^4)(-2c^2)$ $-6c^3d^4$
6. $(4g^3h)(-2g^5)$ $-8g^8h$
7. $(-15xy^4)\left(-\frac{1}{3}xy^3\right)$ $5x^2y^7$
8. $(-xy)^3(xz)$ $-x^4y^3z$
9. $(-18m^2n)^2\left(-\frac{1}{6}mn^2\right)$ $-54m^5n^4$
10. $(0.2a^2b^3)^2$ $0.04a^4b^6$
11. $\left(\frac{2}{3}p\right)^2$ $\frac{4}{9}p^2$
12. $\left(\frac{1}{4}cd^3\right)^2$ $\frac{1}{16}c^2d^6$
13. $(0.4k^3)^3$ $0.064k^9$
14. $[(4^2)^2]^2$ 4^8 or 65,536

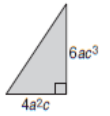
GEOMETRY Express the area of each figure as a monomial.

15. 

$18a^3b^6$

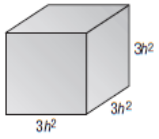
16. 

$(25x^6)\pi$

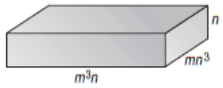
17. 

$12a^3c^4$

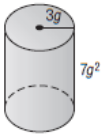
GEOMETRY Express the volume of each solid as a monomial.

18. 

$27h^6$

19. 

m^4n^5

20. 

$(63g^4)\pi$

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

22. **HOBBIES** Tawa wants to increase her rock collection by a power of three this year and then increase it again by a power of two next year. If she has 2 rocks now, how many rocks will she have after the second year? 2^6 or 64

NAME _____ DATE _____ PERIOD ____

8-2 Skills Practice

Dividing Monomials

Simplify. Assume that no denominator is equal to zero.

1. $\frac{6^5}{6^4}$

2. $\frac{9^{12}}{9^8}$

3. $\frac{x^4}{x^2}$

4. $\frac{r^3s^2}{r^3s^4}$

5. $\frac{m}{m^3}$

6. $\frac{9d^7}{3d^6}$

7. $\frac{12n^5}{36n}$

8. $\frac{w^4u^3}{w^4u}$

9. $\frac{a^3b^5}{ab^2}$

10. $\frac{m^7n^2}{m^3n^2}$

11. $\frac{-21w^5u^2}{7w^4u^5}$

12. $\frac{32x^3y^2z^5}{-8xyz^2}$

13. $\left(\frac{4p^7}{7s^2}\right)^2$

14. 4^{-4}

15. 8^{-2}

16. $\left(\frac{5}{3}\right)^{-2}$

17. $\left(\frac{9}{11}\right)^{-1}$

18. $\frac{h^3}{h^{-6}}$

19. $k^0(k^4)(k^{-6})$

20. $k^{-1}(\ell^{-6})(m^3)$

21. $\frac{f^{-7}}{f^4}$

22. $\left(\frac{16p^5q^2}{2p^3q^3}\right)^0$

23. $\frac{f^{-5}g^4}{h^{-2}}$

24. $\frac{15x^6y^{-9}}{5xy^{-11}}$

25. $\frac{-15w^0u^{-1}}{5u^3}$

26. $\frac{48x^6y^7z^5}{-6xy^5z^6}$

NAME _____ DATE _____ PERIOD _____

8-2 Practice

Dividing Monomials

Simplify. Assume that no denominator is equal to zero.

1. $\frac{8^8}{8^4}$

2. $\frac{a^4b^6}{ab^3}$

3. $\frac{xy^2}{xy}$

4. $\frac{m^5np}{m^4p}$

5. $\frac{5c^2d^3}{-4c^2d}$

6. $\frac{8y^7z^6}{4y^6z^5}$

7. $\left(\frac{4f^3g}{3h^6}\right)^3$

8. $\left(\frac{6w^5}{7p^6s^3}\right)^2$

9. $\frac{-4c^2}{24c^5}$

10. $x^3(y^{-5})(x^{-8})$

11. $p(q^{-2})(r^{-3})$

12. 12^{-2}

13. $\left(\frac{3}{7}\right)^{-2}$

14. $\left(\frac{4}{3}\right)^{-4}$

15. $\frac{22r^3s^2}{11r^2s^{-3}}$

16. $\frac{-15w^0u^{-1}}{5u^3}$

17. $\frac{8c^3d^2f^4}{4c^{-1}d^2f^{-3}}$

18. $\left(\frac{x^{-3}y^5}{4^{-3}}\right)^0$

19. $\frac{6f^{-2}g^3h^5}{54f^{-2}g^{-5}h^3}$

20. $\frac{-12t^{-1}u^5v^{-4}}{2t^{-3}uv^5}$

21. $\frac{r^4}{(3r)^3}$

22. $\frac{m^{-2}n^{-5}}{(m^4n^3)^{-1}}$

23. $\frac{(j^{-1}k^3)^{-4}}{j^3k^3}$

24. $\frac{(2a^{-2}b)^{-3}}{5a^2b^4}$

25. $\left(\frac{q^{-1}r^3}{qr^{-2}}\right)^{-5}$

26. $\left(\frac{7c^{-3}d^3}{c^5de^{-4}}\right)^{-1}$

27. $\left(\frac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$

28. BIOLOGY A lab technician draws a sample of blood. A cubic millimeter of the blood contains 22^3 white blood cells and 22^5 red blood cells. What is the ratio of white blood cells to red blood cells?

29. COUNTING The number of three-letter "words" that can be formed with the English alphabet is 26^3. The number of five-letter "words" that can be formed is 26^5. How many times more five-letter "words" can be formed than three-letter "words"?

NAME _____ DATE _____ PERIOD ____

8-2 Skills Practice

Dividing Monomials

Simplify. Assume that no denominator is equal to zero.

1. $\frac{6^5}{6^4}$ 6^1 or 6
2. $\frac{9^{12}}{9^8}$ 9^4 or 6561
3. $\frac{x^4}{x^2}$ x^2
4. $\frac{r^3s^2}{r^3s^4}$ $\frac{1}{s^2}$
5. $\frac{m}{m^3}$ $\frac{1}{m^2}$
6. $\frac{9d^7}{3d^6}$ $3d$
7. $\frac{12n^5}{36n}$ $\frac{n^4}{3}$
8. $\frac{w^4u^3}{w^4u}$ u^2
9. $\frac{a^3b^5}{ab^2}$ a^2b^3
10. $\frac{m^7n^2}{m^3n^2}$ m^4
11. $\frac{-21w^5u^2}{7w^4u^5}$ $-\frac{3w}{u^3}$
12. $\frac{32x^3y^2z^5}{-8xyz^2}$ $-4x^2yz^3$
13. $\left(\frac{4p^7}{7s^2}\right)^2$ $\frac{16p^{14}}{49s^4}$
14. 4^{-4} $\frac{1}{256}$
15. 8^{-2} $\frac{1}{64}$
16. $\left(\frac{5}{3}\right)^{-2}$ $\frac{9}{25}$
17. $\left(\frac{9}{11}\right)^{-1}$ $\frac{11}{9}$
18. $\frac{h^3}{h^{-6}}$ h^9
19. $k^0(k^4)(k^{-6})$ $\frac{1}{k^2}$
20. $k^{-1}(\ell^{-6})(m^3)$ $\frac{m^3}{k\ell^6}$
21. $\frac{f^{-7}}{f^4}$ $\frac{1}{f^{11}}$
22. $\left(\frac{16p^5q^2}{2p^3q^3}\right)^0$ 1
23. $\frac{f^{-5}g^4}{h^{-2}}$ $\frac{g^4h^2}{f^5}$
24. $\frac{15x^6y^{-9}}{5xy^{-11}}$ $3x^5y^2$
25. $\frac{-15w^0u^{-1}}{5u^3}$ $-\frac{3}{u^4}$
26. $\frac{48x^6y^7z^5}{-6xy^5z^6}$ $-\frac{8x^5y^2}{z}$

Lesson 8-2

NAME _____ DATE _____ PERIOD ____

8-2 Practice (Average)

Dividing Monomials

Simplify. Assume that no denominator is equal to zero.

1. $\frac{8^8}{8^4}$ 8^4 or 4096
2. $\frac{a^4b^6}{ab^3}$ a^3b^3
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. $\frac{8y^7z^6}{4y^6z^5}$ $2yz$
7. $\left(\frac{4f^3g}{3h^6}\right)^3$ $\frac{64f^9g^3}{27h^{18}}$
8. $\left(\frac{6w^5}{7p^6s^3}\right)^2$ $\frac{36w^{10}}{49p^{12}s^6}$
9. $\frac{-4c^2}{24c^5}$ $-\frac{1}{6c^3}$
10. $x^3(y^{-5})(x^{-8})$ $\frac{1}{x^5y^5}$
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. $\frac{22r^3s^2}{11r^2s^{-3}}$ $2rs^5$
16. $\frac{-15w^0u^{-1}}{5u^3}$ $-\frac{3}{u^4}$
17. $\frac{8c^3d^2f^4}{4c^{-1}d^2f^{-3}}$ $2c^4f^7$
18. $\left(\frac{x^{-3}y^5}{4^{-3}}\right)^0$ 1
19. $\frac{6f^{-2}g^3h^5}{54f^{-2}g^{-5}h^3}$ $\frac{g^8h^2}{9}$
20. $\frac{-12t^{-1}u^5v^{-4}}{2t^{-3}uv^5}$ $-\frac{6t^2u^4}{v^9}$
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. $\frac{(j^{-1}k^3)^{-4}}{j^3k^3}$ $\frac{j}{k^{15}}$
24. $\frac{(2a^{-2}b)^{-3}}{5a^2b^4}$ $\frac{a^4}{40b^7}$
25. $\left(\frac{q^{-1}r^3}{qr^{-2}}\right)^{-5}$ $\frac{q^{10}}{r^{25}}$
26. $\left(\frac{7c^{-3}d^3}{c^5de^{-4}}\right)^{-1}$ $\frac{c^8}{7d^2e^4}$
27. $\left(\frac{2x^3y^2z}{3x^4yz^{-2}}\right)^{-2}$ $\frac{9x^2}{4y^2z^6}$

28. **BIOLOGY** A lab technician draws a sample of blood. A cubic millimeter of the blood contains 22^3 white blood cells and 22^5 red blood cells. What is the ratio of white blood cells to red blood cells? $\frac{1}{484}$

29. **COUNTING** The number of three-letter "words" that can be formed with the English alphabet is 26^3. The number of five-letter "words" that can be formed is 26^5. How many times more five-letter "words" can be formed than three-letter "words"? 676