

2-6

NAME _____ DATE _____

Multiplying Rational Numbers

(Pages 106–111)

The product of two numbers having the *same sign* is positive. The product of two numbers having *different signs* is negative. It is also useful to note that multiplying a number or expression by -1 results in the opposite of the number or expression. This is called the **multiplicative property of -1** .

EXAMPLES

A Evaluate $-3x^2$ for $x = -\frac{2}{3}$.

$$\begin{aligned} -3x^2 &= -3\left(-\frac{2}{3}\right)^2 && \text{Replace } x \text{ with } -\frac{2}{3}. \\ &= -3\left(\frac{4}{9}\right) && \left(-\frac{2}{3}\right)^2 = -\frac{2}{3} \cdot \left(-\frac{2}{3}\right) \text{ or } \frac{4}{9} \\ &= -\frac{12}{9} && \text{Divide out common factors.} \\ &= -\frac{4}{3} \text{ or } -1\frac{1}{3} && \text{Multiply. The signs are} \\ &&& \text{different, so the product is} \\ &&& \text{negative.} \end{aligned}$$

B Simplify $(-1)(2x)(-3y) + (4x)(-5y)$

$$\begin{aligned} &(-1)(2x)(-3y) + (4x)(-5y) \\ &= 2x(-1)(-3y) + (4x)(-5y) && \text{Commutative Property} \\ &= 2x(3y) + (-20xy) && \text{Multiply.} \\ &= 6xy + (-20xy) && \text{Multiply.} \\ &= -14xy && \text{Combine like terms.} \end{aligned}$$

PRACTICE

Find each product.

- | | | | |
|---|--|---|--|
| 1. $(-2)(3)(-5)$ | 2. $5.26(-0.011)$ | 3. $-10.01(-10.11)$ | 4. $2\left(\frac{3}{5}\right)\left(-\frac{5}{7}\right)$ |
| 5. $\left(-\frac{8}{11}\right)\left(\frac{9}{10}\right)$ | 6. $\left(-\frac{7}{10}\right)\left(-\frac{13}{21}\right)$ | 7. $\left(-\frac{8}{13}\right)(0)\left(-\frac{4}{5}\right)$ | 8. $3\left(\frac{4}{9}\right)(-4)\left(\frac{6}{7}\right)$ |
| 9. $\left(-\frac{2}{5}\right)(-4)\left(-\frac{3}{8}\right)$ | 10. $5\left(\frac{3}{4}\right)(-4)(-2)$ | 11. $8(-0.25)(-3)$ | 12. $\frac{2}{7}(-21)(13)\left(\frac{1}{14}\right)$ |

Evaluate each expression if $r = -\frac{1}{8}$, $s = \frac{4}{5}$, $t = -2\frac{9}{10}$, and $w = -1\frac{2}{9}$.

- | | | | |
|-----------|-----------|--------------|------------------------------------|
| 13. $4rs$ | 14. $2tw$ | 15. $rt - s$ | 16. $s^2\left(-\frac{1}{8}\right)$ |
|-----------|-----------|--------------|------------------------------------|

Simplify.

- | | |
|--|-----------------------------------|
| 17. $2m\left(-\frac{1}{3}n\right) + 3m(-2n)$ | 18. $1.2(3x + y) - 0.8(22x - 2y)$ |
|--|-----------------------------------|



- 19. Standardized Test Practice** The velocity of an object t seconds after the object is dropped from the top of a tall building is about $-9.8t$ meters per second (m/s). What is its velocity 2.5 seconds after it is dropped?

- | | | | |
|----------------------|---------------------|--------------------|---------------------|
| A -24.5 m/s | B -7.3 m/s | C 7.3 m/s | D 18.4 m/s |
|----------------------|---------------------|--------------------|---------------------|

Answers: 1. 30 2. -0.05786 3. 101.2011 4. $-\frac{7}{6}$ 5. $-\frac{55}{36}$ 6. $\frac{30}{13}$ 7. 0 8. $-4\frac{7}{4}$ 9. $-\frac{5}{3}$ 10. 30 11. 6 12. $-\frac{5}{4}$ 13. $-\frac{5}{2}$ 14. $7\frac{45}{4}$ 15. $-\frac{16}{7}$ 16. $-\frac{25}{2}$ 17. $-\frac{63}{2}m$ 18. $-14x + 2.8y$ 19. A