

Lesson 2-3

Example 1 Multiply Integers

Find each product.

a. $-15(4)$

$$-15(4) = -60 \quad \text{different signs} \rightarrow \text{negative product}$$

b. $-6(-17)$

$$-6(-17) = 102 \quad \text{same signs} \rightarrow \text{positive product}$$

Example 2 Simplify Expressions

Simplify the expression $2s(-4r + 2) - 6s(3r)$.

$$\begin{aligned} 2s(-4r + 2) - 6s(3r) &= 2s(-4r) + 2s(2) - 6s(3r) && \text{Distributive Property} \\ &= 2(-4)rs + 2(2)s - 6(3)rs && \text{Commutative Property} \\ &= -8rs + 4s - 18rs && \text{Substitution} \\ &= -8rs - 18rs + 4s && \text{Commutative Property} \\ &= (-8 - 18)rs + 4s && \text{Distributive Property} \\ &= -26rs + 4s && \text{Simplify} \end{aligned}$$

Example 3 Multiplying Rational Numbers

Find $1.1(-3.5)$

$$1.1(-3.5) = -3.85 \quad \text{different signs} \rightarrow \text{negative product}$$

Example 4 Multiply Rational Numbers to Solve a Problem

The Nautilus was the world's first nuclear powered submarine. It could descend 8 feet for every 10 feet that it moved forward. If it moved forward 605 feet while descending from the surface, where would it be in relation to sea level?

If the submarine has moved forward 605 feet, then it has moved 60.5 times 10 feet. To find the total number of feet it has descended, multiply 60.5 by -8. (-8 since the submarine is descending).

$$60.5 \cdot -8 = -484 \quad \text{different signs} \rightarrow \text{negative product}$$

The submarine is 484 feet below sea level.

Example 5 Evaluate Expressions

Evaluate $2x(3 - y)$ if $x = -4$ and $y = 3.5$.

$$\begin{aligned} 2x(3 - y) &= 2(-4)(3 - 3.5) && \text{Substitution} \\ &= (-8)(-0.5) && 2(-4) = -8, 3 - 3.5 = -0.5 \\ &= 4 && \text{same signs} \rightarrow \text{positive product} \end{aligned}$$