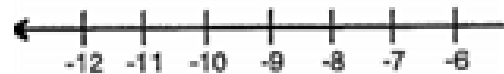


Get out your homework from last night and have it ready to check. Make sure that you are ready to take the Target Check after we check the homework. Check your answers with the key below.

Classwork - Target Check and Multiplying Integers

A) $-7 + (-5) = -12$



B) $-12 + 9 = -3$



C) $-2 - 9 = -11$



D) $7 - (-3) = 10$



F) $-6 + (-1) = -7$



G) $8 - 18 = -10$



H) $-3 + (-3) = -6$



I) $-5 + 9 = 4$



J) $-6 - (-5) = -1$

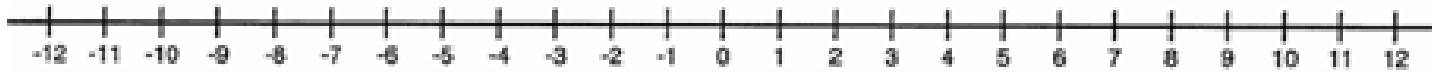


K) $12 - 15 = -3$



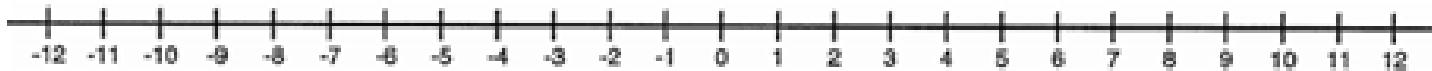
$$L) 6 + (-4) = 2$$

$$M) -12 - 2 = -14$$



$$N) 6 - 14 = -8$$

$$O) -9 + (-2) = -11$$



$$P) 7 + (-7) = 0$$

$$Q) -1 - 13 = -14$$



$$R) -5 - (-5) = 0$$

$$S) -4 + 2 - 8 = -10$$

$$-2 - 8 = -10$$





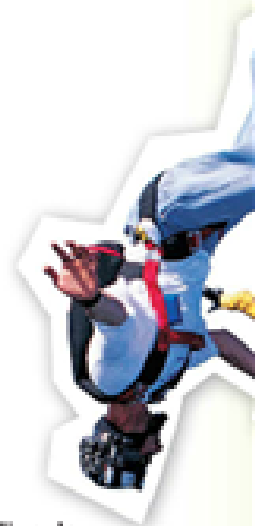
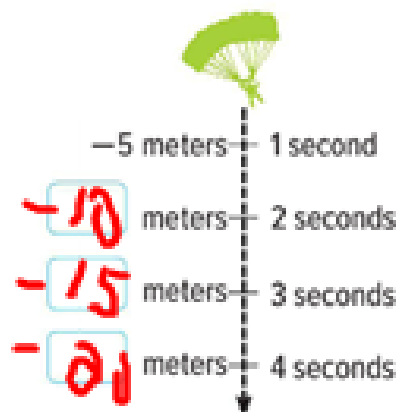
Real-World Link



Skydiving Once a parachute is deployed, a skydiver descends at a rate of about 5 meters per second. Where will the skydiver be in relation to where the parachute deployed after 4 seconds?

1. Descending is usually represented by a negative integer. What integer should you use to represent the position of the skydiver in relation to the parachute's deployment after 1 second? -5

2. Complete the graphic below. What is the skydiver's position after 2, 3, and 4 seconds?



3. Write a multiplication sentence to represent the skydiver's position after 5 seconds.

$$5(-5) = -25$$

Multiply Integers with Different Signs

Words The product of two integers with different signs is negative.

Examples $6(-4) = -24$ $-5(7) = -35$

$$(-4)(6) = -24$$

Remember that multiplication is the same as repeated addition.

$$\begin{aligned} 4(-3) &= (-3) + (-3) + (-3) + (-3) && -3 \text{ is used as an} \\ &= -12 && \text{addend four times.} \end{aligned}$$



The Commutative Property of Multiplication states that you can multiply in any order. So, $4(-3) = -3(4)$.

Examples



1. Find $3(-5)$.

$$3(-5) = -15 \quad \text{The integers have different signs. The product is negative.}$$

2. Find $-6(8)$.

$$-6(8) = -48 \quad \text{The integers have different signs. The product is negative.}$$

Got it? Do these problems to find out.

a. $9(-2) = -18$

b. $-7(4) = -28$

Multiply Integers with the Same Signs

Words The product of two integers with the same sign is positive.

Examples $2(6) = 12$

$-10(-6) = 60$

The product of two positive integers is positive. You can use a pattern to find the sign of the product of two negative integers. Start with $(2)(-3) = -6$ and $(1)(-3) = -3$.

positive \times negative = negative

The Multiplicative Property of Zero

negative \times negative = positive

$(2)(-3) = -6$

$(1)(-3) = -3$

$(0)(-3) = 0$

$(-1)(-3) = 3$

$(-2)(-3) = 6$

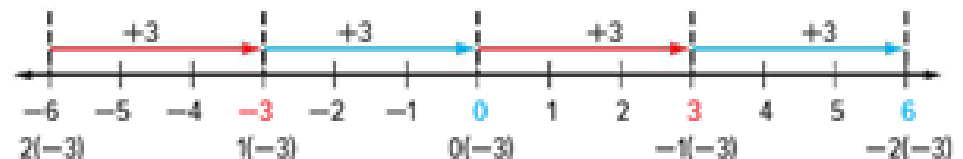
+3

+3

+3

+3

Each product is 3 more than the previous product. This pattern can also be shown on a number line.



If you extend the pattern, the next two products are $(-3)(-3) = 9$ and $(-4)(-3) = 12$.

Examples

3. Find $-11(-9)$.

$$-11(-9) = 99 \quad \text{The integers have the same sign. The product is positive.}$$

4. Find $(-4)^2$.

$$\begin{aligned} (-4)^2 &= (-4)(-4) && \text{There are two factors of } -4. \\ &= 16 && \text{The product is positive.} \end{aligned}$$

Handwritten work for Example 4:

$$(-4)^3 \rightarrow (-4)(-4)(-4)$$

Diagram showing the multiplication of three factors of -4:

$$\begin{array}{c} (-4)(-4)(-4) \\ \swarrow \quad \downarrow \quad \searrow \\ 16(-4) \\ \downarrow \\ -64 \end{array}$$

5. Find $-3(-4)(-2)$.

$$\begin{aligned} -3(-4)(-2) &= [-3(-4)](-2) && \text{Associative Property} \\ &= 12(-2) && -3(-4) = 12 \\ &= -24 && 12(-2) = -24 \end{aligned}$$

Got it? Do these problems to find out.

c. $-12(-4)$

Handwritten: 48

d. $(-5)^2$

Handwritten: $(-5)(-5)$
 25

e. $-7(-5)(-3)$

Handwritten: $-7(15)$
 -105



Example



6. A submersible is diving from the surface of the water at a rate of 90 feet per minute. What is the depth of the submersible after 7 minutes?

The submersible descends 90 feet per minute. After 7 minutes, the vessel will be at $7(-90)$ or -630 feet. The submersible will descend to 630 feet below the surface.

Got it? Do this problem to find out.

- f. **Financial Literacy** Mr. Simon's bank automatically deducts a \$4 monthly maintenance fee from his savings account. Write a multiplication expression to represent the maintenance fees for one year. Then find the product and explain its meaning.

$$-4(12) = -48$$

Guided Practice



Multiply. (Examples 1–5)

$$1. 6(-10) = \underline{-60}$$

$$2. (-3)^3 = \underline{-27}$$
$$(-3)(-3)(-3)$$
$$9(-3) = -27$$

$$3. (-1)(-3)(-4) = \underline{-12}$$

$$7(-5) = \underline{-35}$$

$$-4(-12)$$
$$48$$

$$5(-2)(-8)$$
$$(-10)(-8)$$
$$80$$