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## Unit 5, Lesson 10: Multiply!

Let's get more practice multiplying signed numbers.

### 10.1: Which One Doesn't Belong: Expressions

Which expression doesn't belong?

$7.9x$

$7.9 + x$

$7.9 \cdot (-10)$

$-79$

### 10.2: Matching Expressions

Match expressions that are equal to each other.

$(-1) \cdot 12$	$(-64) \cdot \frac{1}{8}$	$1 \cdot 15$
$(-1) \cdot (-3) \cdot (-5)$	$(-1) \cdot (-2) \cdot 6$	$(-1) \cdot (-12)$
$1 \cdot (-3) \cdot (-5)$	$(-\frac{1}{4}) \cdot (-32)$	$(-2) \cdot 6$
$(-\frac{1}{2}) \cdot (-16)$	$(-3) \cdot 5$	$2 \cdot (-4)$
$(-\frac{1}{2}) \cdot 16$	$(-1) \cdot (-3) \cdot (-4)$	$2 \cdot 4$
$(-1) \cdot (-3) \cdot 4$	$(-3) \cdot (-5)$	$1 \cdot (-15)$

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### 10.3: Row Game: Multiplying Rational Numbers

Evaluate the expressions in one of the columns. Your partner will work on the other column. Check in with your partner after you finish each row. Your answers in each row should be the same. If your answers aren't the same, work together to find the error.

column A	column B
$790 \div 10$	$(7.9) \cdot 10$
$\left(-\frac{6}{7}\right) \cdot 7$	$(0.1) \cdot (-60)$
$(2.1) \cdot (-2)$	$(-8.4) \cdot \frac{1}{2}$
$(2.5) \cdot (-3.25)$	$\left(-\frac{5}{2}\right) \cdot \frac{13}{4}$
$(-10) \cdot (3.2) \cdot (-7.3)$	$5 \cdot (-1.6) \cdot (-29.2)$

#### Are you ready for more?

A sequence of rational numbers is made by starting with 1, and from then on, each term is one more than the reciprocal of the previous term. Evaluate the first few expressions in the sequence. Can you find any patterns? Find the 10th term in this sequence.

$$1 \quad 1 + \frac{1}{1} \quad 1 + \frac{1}{1+1} \quad 1 + \frac{1}{1 + \frac{1}{1+1}} \quad 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{1+1}}} \quad \dots$$

#### Lesson 10 Summary

A positive times a positive is always positive. For example,  $\frac{3}{5} \cdot \frac{7}{8} = \frac{21}{40}$ .

A negative times a negative is also positive. For example,  $-\frac{3}{5} \cdot -\frac{7}{8} = \frac{21}{40}$ .

A negative times a positive or a positive times a negative is always negative. For example,  $\frac{3}{5} \cdot -\frac{7}{8} = -\frac{3}{5} \cdot \frac{7}{8} = -\frac{21}{40}$ .

A negative times a negative times a negative is also negative. For example,  $-3 \cdot -4 \cdot -5 = -60$ .

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## Unit 5, Lesson 10: Multiply!

1. Evaluate each expression:

a.  $-12 \cdot \frac{1}{3}$

b.  $-12 \cdot \left(-\frac{1}{3}\right)$

c.  $12 \cdot \left(-\frac{5}{4}\right)$

d.  $-12 \cdot \left(-\frac{5}{4}\right)$

2. Evaluate each expression:

a.  $(-1) \cdot 2 \cdot 3$

b.  $(-1) \cdot (-2) \cdot 3$

c.  $(-1) \cdot (-2) \cdot (-3)$

3. Order each set of numbers from least to greatest.

a. 4, 8, -2, -6, 0

b. -5, -5.2, 5.5,  $-5\frac{1}{2}$ ,  $\frac{-5}{2}$

(from Unit 5, Lesson 1)

4.  $30 + -30 = 0$ .

a. Write another sum of two numbers that equals 0.

b. Write a sum of three numbers that equals 0.

c. Write a sum of four numbers that equals 0, none of which are opposites.

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(from Unit 5, Lesson 3)

5. A submarine is searching for underwater features. It is accompanied by a small aircraft and an underwater robotic vehicle.

At one time the aircraft is 200 m above the surface, the submarine is 55 m below the surface, and the underwater robotic vehicle is 227 m below the surface.

- What is the difference in height between the submarine and the aircraft?
- What is the distance between the underwater robotic vehicle and the submarine?

(from Unit 5, Lesson 6)

6.
  - Clare is cycling at a speed of 12 miles per hour. If she starts at a position chosen as zero, what will her position be after 45 minutes?
  - Han is cycling at a speed of -8 miles per hour; if he starts at the same zero point, what will his position be after 45 minutes?
  - What will the distance between them be after 45 minutes?

(from Unit 5, Lesson 8)

7. Fill in the missing numbers in these equations

- $(-7) \cdot ? = -14$
- $? \cdot 3 = -15$
- $? \cdot 4 = 32$
- $-49 \cdot 3 = ?$

(from Unit 5, Lesson 9)