

Quick Review

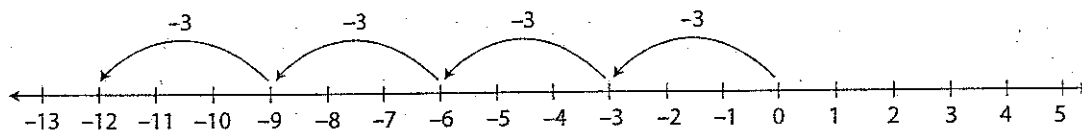
- You can think of multiplication as repeated addition.

$4 \times (-3)$ is the same as adding -3 four times.

As a sum: $(-3) + (-3) + (-3) + (-3) = -12$

As a product: $4 \times (-3) = -12$

On a number line:



- You can use tiles to multiply integers.

Let a circle represent the bank. The bank has zero value at the start.

Multiply: $(+2) \times (-3)$

$+2$ is a positive integer.

-3 is modelled with 3 black tiles.

So, put 2 sets of 3 black tiles into the circle.



The 6 black tiles in the circle represent -6 .

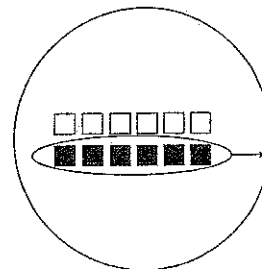
So, $(+2) \times (-3) = -6$

- Multiply: $(-2) \times (-3)$

-2 is a negative integer.

-3 is modelled with 3 black tiles.

So, we need to take 2 sets of 3 black tiles from the circle.



Add zero pairs until there are enough black tiles to remove.

Take out 2 sets of 3 black tiles.

There now are 6 white tiles left in the circle.

So, $(-2) \times (-3) = 6$

Practice

1. Write a multiplication expression for each repeated addition.

a) $(-2) + (-2) + (-2) + (-2) + (-2) = 5 \times \underline{\hspace{2cm}}$

b) $(+11) + (+11) + (+11) = \underline{\hspace{2cm}}$

c) $(-5) + (-5) + (-5) = \underline{\hspace{2cm}}$

2. Write each multiplication expression as a repeated addition. Then use a number line to find each sum.

a) $(+2) \times (-4) = (-4) + (-4)$
 $=$ _____

b) $(+5) \times (+4) =$ _____
 $=$ _____

c) $(-3) \times (+2) = (+2) \times (-3)$
 $=$ _____
 $=$ _____

3. Write a multiplication equation for each model. Find the product.

a) Deposit 3 sets of 2 black tiles.

$3 \times (-2) =$ _____

b) Deposit 5 sets of 2 white tiles.

_____ $\times (+2) =$ _____

c) Withdraw 2 sets of 3 black tiles.

_____ \times _____ $=$ _____

d) Withdraw 9 sets of 2 black tiles.

e) Deposit 4 sets of 3 black tiles.

4. Use a tile model to find each product.

a) $(+7) \times (-2) =$ _____

b) $(+3) \times (+5) =$ _____

c) $(+2) \times (-3) =$ _____

d) $(-4) \times (+5) =$ _____

HINT

Add enough zero pairs to take away the appropriate number of white tiles.



5. Use a model to represent each product. Draw the model you used each time.

a) $(-3) \times (-4) =$ _____

b) $(+2) \times (-5) =$ _____

c) $(+7) \times (+2) =$ _____

d) $(-3) \times (+6) =$ _____

6. The temperature dropped 2°C each hour for 4 h. Use integers to find the total change in temperature.



Quick Review

➤ Integers have these properties of whole numbers.

• **Multiplying by 0:** $4 \times 0 = 0$ and $0 \times 4 = 0$

So, $(-4) \times 0 = 0$ and $0 \times (-4) = 0$

• **Multiplying by 1:** $4 \times 1 = 4$ and $1 \times 4 = 4$

So, $(-4) \times (+1) = -4$ and $(+1) \times (-4) = -4$

• **Commutative Property:** $4 \times 2 = 8$ and $2 \times 4 = 8$

So, $(-4) \times (+2) = -8$ and $(+2) \times (-4) = -8$

• **Distributive Property:** $4 \times (2 + 3) = 4 \times 2 + 4 \times 3 = 20$

So, $(-4) \times [(+2) + (+3)] = (-4) \times (+2) + (-4) \times (+3) = -20$

➤ You can write the product of integers without the use of the \times sign.

$(-4) \times (+2)$ can simply be written as: $(-4)(+2)$

➤ When 2 integers with the same sign are multiplied, their product is positive.

$(+2)(+3) = +6$

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

When 2 integers with different signs are multiplied, their product is negative.

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

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

Practice

1. Find a pattern rule for each multiplication pattern.

Extend the pattern for 3 more rows.

a) $(+3)(+3) = +9$

b) $(-3)(+3) = -9$

$(+2)(+3) = +6$

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

$(+1)(+3) = +3$

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

$(0)(+3) = \underline{\hspace{2cm}}$

$(-3)(0) = \underline{\hspace{2cm}}$

$(\underline{\hspace{1cm}})(+3) = \underline{\hspace{2cm}}$

$\underline{\hspace{2cm}}$

$\underline{\hspace{2cm}}$

$\underline{\hspace{2cm}}$

$\underline{\hspace{2cm}}$

$\underline{\hspace{2cm}}$

HINT

To find a pattern rule, look for a pattern in the integer factors and in the products.



2. In this chart, write the sign of each product of multiplying 2 integers.

\times	positive integer	negative integer
positive integer		
negative integer		

- When 2 integer factors have the same sign, their product is _____.
- When 2 integer factors have different signs, their product is _____.

3. Find each product.

- a) $(+7)(-2) =$ _____ b) $(-4)(-3) =$ _____ c) $(-8)(+9) =$ _____
 d) $(+10)(-5) =$ _____ e) $(+5)(-7) =$ _____ f) $(-9)(-4) =$ _____
 i) $(-7)(-1) =$ _____ j) $(+5)(0) =$ _____ k) $(+20)(-20) =$ _____

4. Fill in the blank to make each equation true.

- a) $(+7) \times$ _____ $= -35$ b) _____ $\times (-9) = +99$ c) $(-10) \times$ _____ $= -320$
 d) _____ $\times (-5) = +20$ e) $(+7) \times$ _____ $= -49$ f) _____ $\times (+13) = -65$
 g) _____ $\times (-15) = -180$ h) $(+14) \times$ _____ $= -140$ i) _____ $\times (-7) = 56$

5. Match each pattern rule with the corresponding pattern.
 Complete each pattern and pattern rule.

Number Pattern

-3, +9, -27, +81, ...

+2, -10, +50, -250, ...

+3, -3, _____, _____, ...

+1, -10, _____, _____, ...

-1, -2, -4, -8, -16, ...

Pattern Rule

Start at 2. Multiply by _____ each time.

Start at 1. Multiply by -10 each time.

Start at _____. Multiply by -3 each time.

Start at 3. Multiply by -1 each time.

Start at -1. Multiply by _____ each time.