

Sept. 7

Adding Integers

Obj: I will be able to add integers and model integer addition

warm-up

**MIND.
READY.
MATH.**

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Class FUN math Date 9/7

Explain why -2 is greater than -7 in 1-3 sentences.

-2 is greater because it is closer to 0 from the left side. -7 is further away from zero on the left side, the further away on the left of zero the smaller the number.

Adding Integers

What if the integers have the same sign?

A Closer Look: Find the sum of $-5 + -6$.

1 Add the numbers.

$$-5 + -6$$

$$5 + 6 = 11$$

2 Use the sign of the integers.

The sign is - (negative)

$$-5 + -6 = -11$$

What it means:

(1) Adding $5 + 6$ is like adding the absolute values of the integers.

$$|-5| = 5 \text{ and } |-6| = 6 \text{ and } 5 + 6 = 11$$

(2) The sign represents the direction and how far the sum is from zero.

-11 is eleven spaces to the left of zero.

Find the sum. $4 + 9$ 13	Find the sum. $-2 + (-8)$ $2 + 8 = 10$	Find the sum. $22 + 30$ 52	Find the sum. $-15 + (-16)$ -31
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What if the integers have different signs?

A Closer Look: Find the sum of $-3 + 5$.

1 Subtract the smaller number from the larger number.

$$-3 + 5$$

$$5 - 3 = 2$$

2 Use the sign of the larger number.

5 is larger than -3

$$-3 + 5 = 2 \quad \mathbf{2}$$

What it means:

(1) Subtracting 3 from 5 is like subtracting $|-3|$ from $|5|$.

$$|-3| = 3 \text{ and } |5| = 5 \text{ and } 5 - 3 = 2$$

(2) The sign represents the direction and how far the sum is from zero.

2 is two spaces to the right of zero.

Find the sum. $6 + (-7)$ $7 - 6 = -1$	Find the sum. $-11 + 1$ $11 - 1 = -10$	Find the sum. $-8 + 20$ $20 - 8 = 12$	Find the sum. $9 + (-4)$ $9 - 4 = 5$
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Modeling Integer Addition

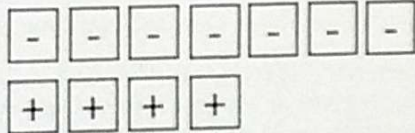
Using Integer Tiles or Counters

There are various types of integer tiles and counters, including square-shaped and circular-shaped. To model integer addition with physical tiles or counters, use one color to represent the negative and another color to represent the positive.

On this page, use $\boxed{+}$ to represent $+1$ and $\boxed{-}$ to represent -1 .

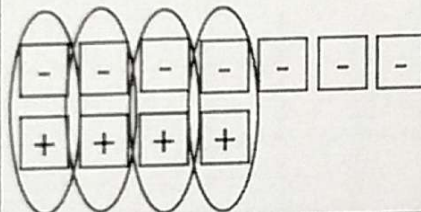
Step One: Model $-7 + 4$

Count out the proper number of counters.



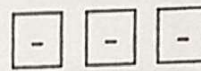
Step Two: Eliminate zero pairs

Eliminate zero pairs



Step Three: Remaining counters represent the sum

Remaining counters represent the sum

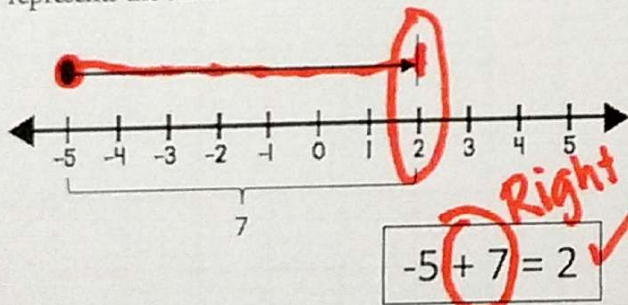


There are 3 negative tiles left.
 $-7 + 4 = -3$

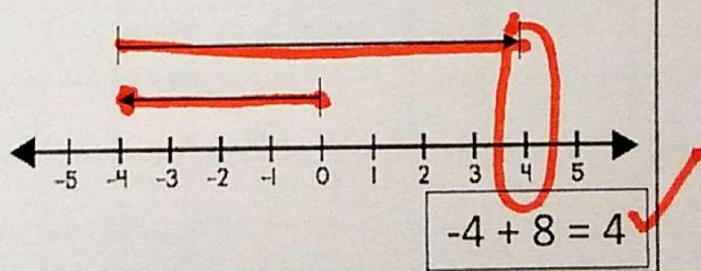
How do zero pairs work? The additive inverse property states that the sum of a number and its opposite is zero. Since one positive counter equals $+1$ and one negative counter equals -1 , $1 + (-1) = 0$.

Using Number Lines

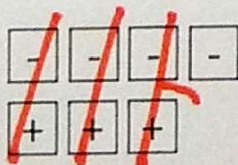
Method One: Start at the first number. Draw a ray the length of the second number (negative = go left; positive = go right). The position of the ray's tip represents the sum.



Method Two: Start at zero. Draw a ray the length of the first number (negative = go left; positive = go right). Draw a mark above the first integer. Draw another ray the length of the second number. The position of the second ray's tip represents the sum.

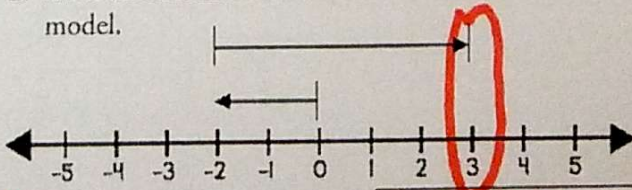


1. Write an addition number sentence based on the model.



$$-4 + 3 = -1$$

2. Write an addition number sentence based on the model.



$$-2 + 5 = 3$$

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Help the process detectives understand the solutions by attaching the steps to each problem in the proper order.

$$-3 + (-7)$$

Find the absolute values of -3 and -7 **1**

Add $3 + 7$ **2**

Use the sign of the addends **3**

$$-10$$

$$8 + (-2)$$

Find the absolute values of 8 and -2 **1**

Subtract $8 - 2$ **2**

Use the sign from 8 **3**

$$6$$

$$-11 + 6$$

Find the absolute values of -11 and 6 **1**

Subtract $11 - 6$ **2**

Use the sign from -11 **3**

$$-5$$

$$19 + (-4)$$

Find the absolute value of 19 and -4 **1**

Subtract $19 - 4$ **2**

Use the sign from 19 **3**

$$15$$

Adding Integers Notes

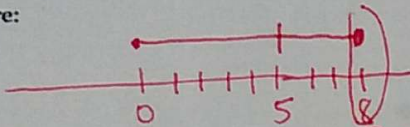
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Positives:

Negatives:

1. $5 + 3$

Picture:



$$5 + 3 = 8$$

Are the signs the same or different?

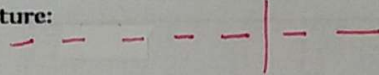
same

Answer:

8

2. $-5 + (-2)$

Picture:



$$5 + 2 = -7$$

Are the signs the same or different?

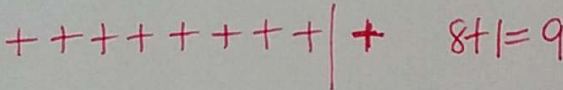
same

Answer:

-7

3. $8 + 1$

Picture:



$$8 + 1 = 9$$

Are the signs the same or different?

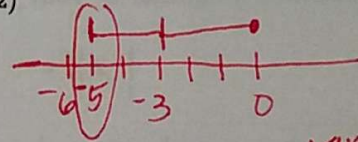
same

Answer:

9

4. $-3 + (-2)$

Picture:



$$3 + 2 = 5$$

Are the signs the same or different?

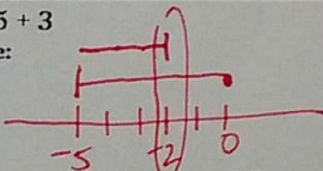
same

Answer:

-5

5. $-5 + 3$

Picture:



$$5 - 3 = 2$$

Are the signs the same or different?

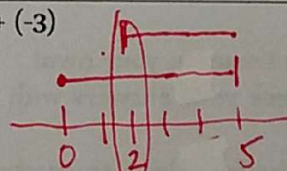
different

Answer:

-2

6. $5 + (-3)$

Picture:



$$5 - 3 = 2$$

Are the signs the same or different?

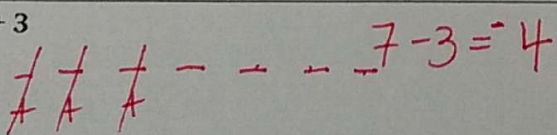
different

Answer:

2

7. $-7 + 3$

Picture:



$$7 - 3 = 4$$

Are the signs the same or different?

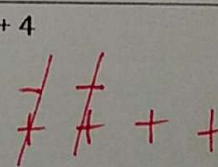
different

Answer:

-4

8. $-2 + 4$

Picture:



$$4 - 2 = 2$$

Are the signs the same or different?

Answer:

2