2.2 Add Real Numbers

Goal • Add positive and negative numbers.

Your Notes

VOCABULARY

Additive identity The number 0 in the identity property; the sum of a number a and 0 is a.

Additive inverse The opposite of a as stated in the inverse property; the sum of a number a and its opposite is 0.

Example 1 ***Add two integers using a number line***

Use the number line to find the sum.

a. $-5 + 7$

Remember: To add a positive number, move to the right on a number line. To add a negative number, move to the left.

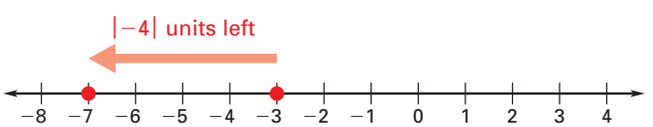
Start at -5.

To add, move $\sum 7 \sum$ units to the right.

End at 2.

Answer: $-5 + 7 =$ 2.

b. $-3 + (-4)$



Start at -3.

To add, move $\sum -4 \sum$ units to the left.

End at -7.

Answer: $-3 + (-4) =$ -7.

Your Notes

RULES OF ADDITION

To add two numbers with the *same sign*:

1. Add their absolute values.

2. The sum has the same sign as the numbers added.

Example: $-5 + (-7) =$ -12

To add two numbers with *different signs*:

1. Subtract the lesser absolute value.

2. The sum has the same sign as the number with the greater absolute value.

Example: $-10 + 4 =$ -6

Example 2 ***Add real numbers***

Find the sum.

a. $-2.5 + (-4.2) = -(|-2.5| + |-4.2|)$ **Rule of same signs**

$= -(2.5 + 4.2)$ **Take absolute values.**

$= -6.7$ **Add.**

b. $10.5 + (-15.0) = |-15.0| - |10.5|$ **Rule of different signs**

$= 15.0 - 10.5$ **Take absolute values.**

$= -4.5$ **Subtract and take sign from greater absolute value.**

✔ ***Checkpoint*** **Find the sum.**

1. $-7 + (-3)$ -10	**2.** $9.6 + (-2.1)$ 7.5

Your Notes

PROPERTIES OF ADDITION

Commutative Property The order in which you add two numbers does not change the sum.

$a + b =$ *b* + *a*

Example: $-1 + 3 =$ 3 + (–1)

Associative Property The way you group three numbers in a sum does not change the sum.

$(a + b) + c =$ *a* + (*b* + *c*)

Example: $(1 + 2) + 3 =$ 1 + (2 + 3)

Identity Property The sum of a number and 0 is the number.

$a + 0 =$ 0 + *a* = *a*

Example: $4 + 0 =$ 4

Inverse Property The sum of a number and its opposite is 0.

$a + (-a) =$ −*a* + *a* = 0

Example: $-9 +$ 9 $= 0$

Example 3 *Identify properties of addition*

Identify the property illustrated by the statement.

Statement	Property Illustrated
a. $x + 5 = 5 + x$	Commutative property of addition
b. $y + 0 = y$	Identity property of addition

Homework

✔ ***Checkpoint*** **Identify the property being illustrated.**

3. $-5 + 5 = 0$

Inverse property of addition

4. $(-5 + 2) + 3 = -5 + (2 + 3)$

Associative property of addition