Name_____ Class_____ Date_____

Lesson 1-4 *(pp. 24–31)*   **Adding Real Numbers**

Lesson Objectives	**NAEP 2005 Strand:** Number Properties and Operations
▼ Add real numbers using models and rules	**Topic:** Number Operations
▼ Apply addition	**Local Standards:** _____

Vocabulary and Key Concepts

Identity Property of Addition

For every real number n, $\boxed{}$.

Examples $0 + 5 = \boxed{}$ $-5 + 0 = \boxed{}$

Inverse Property of Addition

For every real number n, there is an additive inverse $-n$ such that $\boxed{}$.

Examples $17 + (-17) = \boxed{}$ $-17 + 17 = \boxed{}$

Adding Numbers With the Same Sign

To add two numbers with the same sign, $\boxed{}$ their absolute values.

The sum has the $\boxed{}$ sign as the addends.

Examples $2 + 6 = \boxed{}$ $-2 + (-6) = \boxed{}$

Adding Numbers With Different Signs

To add two numbers with different signs, find the $\boxed{}$ of

their absolute values. The sum has the same sign as the addend with the

$\boxed{}$ absolute value.

Examples $-2 + 6 = \boxed{}$ $2 + (-6) = \boxed{}$

An additive inverse is _____

The sum of additive inverses is _____

A matrix is _____

An element is _____

Examples

❶ Using a Number Line Model Use a number line to simplify the expression.
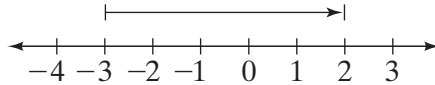
a. $3 + (-5)$

$3 + (-5) = \boxed{}$

Start at $\boxed{}$.

Move left $\boxed{}$ units.

$-3\ -2\ -1\quad 0\quad 1\quad 2\quad 3\quad 4$

b. $-3 + 5$

$-3 + 5 = \boxed{}$

Start at $\boxed{}$.

Move right $\boxed{}$ units.

$-4\ -3\ -2\ -1\quad 0\quad 1\quad 2\quad 3$
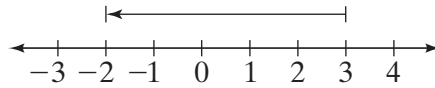
❷ Adding Numbers Simplify each expression.

a. $12 + (-23) = \boxed{}$ The difference of the absolute values is $\boxed{}$. The $\boxed{}$

addend has the greater absolute value, so the sum is $\boxed{}$.

b. $-6.4 + (-8.6) = \boxed{}$ Since both addends are $\boxed{}$, add their absolute values.

The sum is $\boxed{}$.

❸ Evaluating Expressions A scuba diver who is 88 ft below sea level begins to ascend to the surface.

a. Write an expression to represent the diver's depth below sea level after rising any number of feet.

Relate $\boxed{\text{88 ft below sea level}}$ plus $\boxed{\text{feet diver rises}}$

Define Let $\boxed{r}$ = the number of feet diver rises.

Write $\boxed{}$ $+$ $\boxed{}$

$\boxed{} + \boxed{}$

b. Find the new depth of the scuba diver after rising 37 ft.

$-88 + r = -88 + \boxed{}$ Substitute $\boxed{}$ for r.

$= \boxed{}$ Simplify.

The scuba diver is $\boxed{}$ ft below sea level.

❹ Adding Matrices Add $\begin{bmatrix} -6 & 8.6 & 11 \\ 2.3 & 5 & -3 \end{bmatrix} + \begin{bmatrix} 7 & -5.4 & -2 \\ 11.1 & 3 & -1 \end{bmatrix}$.

$\begin{bmatrix} -6 & 8.6 & 11 \\ 2.3 & 5 & -3 \end{bmatrix} + \begin{bmatrix} 7 & -5.4 & -2 \\ 11.1 & 3 & -1 \end{bmatrix}$

$= \begin{bmatrix} \boxed{} + \boxed{} & \boxed{} + (\boxed{}) & \boxed{} + (\boxed{}) \\ \boxed{} + \boxed{} & \boxed{} + \boxed{} & \boxed{} + (\boxed{}) \end{bmatrix}$ Add corresponding elements.
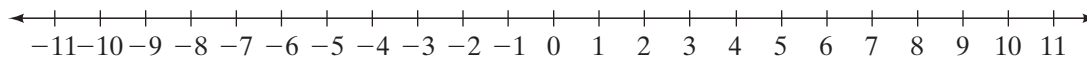
$= \begin{bmatrix} \boxed{} & \boxed{} & \boxed{} \\ \boxed{} & \boxed{} & \boxed{} \end{bmatrix}$ Simplify.

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Check Understanding

1. Use the number line to find each sum.

$$\overset{\longleftarrow}{\underset{-11\ -10\ -9\ -8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4\ \ 5\ \ 6\ \ 7\ \ 8\ \ 9\ \ 10\ \ 11}{\rule{11cm}{0.4pt}}}{\longrightarrow}$$

a. $-6 + 4$ **b.** $4 + (-6)$ **c.** $-3 + (-8)$ **d.** $9 + (-3)$

2. Find each sum.

a. $-7 + (-4)$ **b.** $-26.3 + 8.9$ **c.** $-\frac{3}{4} + \left(-\frac{1}{2}\right)$ **d.** $\frac{8}{9} + \left(-\frac{5}{6}\right)$

3. The temperature falls 15 degrees and then rises 18 degrees. Use addition to find the change in temperature.

4. Evaluate each expression for $t = -7.1$.

a. $t + (-4.3)$ **b.** $-2 + t$ **c.** $8.5 + (-t)$ **d.** $-t + 7.49$

5. Find each sum.

a. $\begin{bmatrix} 5 \\ 3.2 \\ -4.9 \end{bmatrix} + \begin{bmatrix} -9 \\ -1.7 \\ -11.1 \end{bmatrix} = \begin{bmatrix} \square + \square \\ \square + \square \\ \square + \square \end{bmatrix} = \begin{bmatrix} \square \\ \square \\ \square \end{bmatrix}$

b. $\begin{bmatrix} -4 & \frac{7}{8} \\ \frac{3}{4} & 0 \end{bmatrix} + \begin{bmatrix} -5 & -\frac{3}{4} \\ \frac{1}{2} & -1 \end{bmatrix} = \begin{bmatrix} \square + \square & \square + \square \\ \square + \square & \square + \square \end{bmatrix} = \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix}$

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