

L2-1 Integers and Absolute Value

New Vocabulary

Define the following, as best you can, in your own words. Do not simply copy the definition from the back of the book or in context. If you don't understand what the word means, then leave space and adjust your definition when we discuss the words. If you think you know what it means, GREAT; write your definition and refine it, as needed, when we discuss the vocabulary.

- integers - whole #'s and their opposites
- opposites - #'s that have the same absolute value but on different sides of 0 (- 5 and +5)
- positive number - # greater than 0
- positive integer - whole # greater than 0
- negative number - # less than 0
- negative integer - whole # less than 0
- coordinate - tell the location of something (x,y)
coordinates; longitude and latitude
- inequality - two things that do not have the same value
- absolute value - #'s distance from 0; it is always positive

Write Integers for Real-World Situations

Write an integer for 32 feet underground.

-32

Write an integer for 8 weeks after birth.

$+8$

Write an integer for 15 feet above sea level.

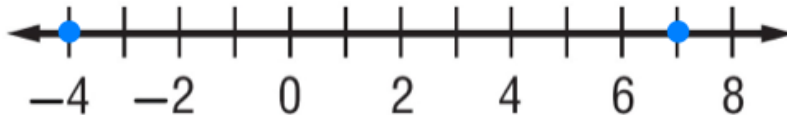
$+15$

Write an integer for a loss of 12 yards.

-12

Compare Two Integers

Use the integers graphed on the number line below. Write two inequalities involving 7 and -4.



$$7 > -4 \quad \text{seven is greater than } -4$$
$$-4 < 7 \quad \text{-4 is less than } 7$$

Use the integers graphed on the number line below. Replace the \bigcirc with $<$, $>$, or $=$ in $-2 \bigcirc 3$ to make a true sentence.



$$-2 \text{ (<) } 3$$

Order Integers

WEATHER The high temperatures for the first seven days of January were ~~-8°F~~ , ~~10°F~~ , ~~2°F~~ , ~~-3°F~~ , ~~-11°F~~ , ~~0°F~~ , and 1°F . Order the temperatures from least to greatest.

-11° , -8° , -3° , 0° , 1° , 2° , 10°

FOOTBALL The yards gained during the first six plays of a football game were 5, -3, 12, -9, 6, and -1. Order the yards from least to greatest.

$-9, -3, -1, 5, 6, 12$

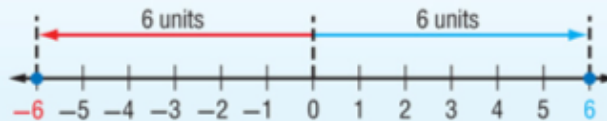


Key Concept

Absolute Value

Words The absolute value of a number is the distance the number is from zero on the number line. The absolute value of a number is always greater than or equal to zero.

Example $|6|$ and $|-6|$



Symbols $|6| = 6$ The absolute value of 6 is 6.
 $|-6| = 6$ The absolute value of -6 is 6.

Grouping Symbols

[]

{ }

Brackets/Braces

() Parentheses

8^3

$8^{(3)}$

Exponent

$\frac{2}{3}$

$\frac{x+8}{y-9}$

Fraction Bar

$|6|$

$|-6|$

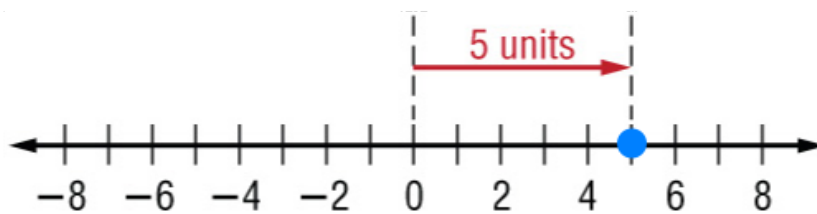
$|a|$

Absolute Value

Expressions with Absolute Value

Evaluate $|5|$.

Evaluate means solve



$$|5| = 5$$

$$|-5| = 5$$

Evaluate $|-9|$.

$$|-9| = 9$$

Evaluate $|-8| + |-1|$.

$$\begin{aligned} |-8| + |-1| &= \\ 8 + 1 &= \textcircled{9} \end{aligned}$$

① evaluate
abs. val.

② computation

Evaluate $|-9| + |2|$.

$$\begin{aligned} |-9| + |2| &= \\ 9 + 2 &= \textcircled{11} \end{aligned}$$

Algebraic Expressions with Absolute Value

Evaluate $|x| + 8$ if $x = -2$.

$$\begin{aligned} |x| + 8 &= \\ |-2| + 8 &= \\ 2 + 8 &= \textcircled{10} \end{aligned}$$

- ① Subst. value of variable
- ② Abs. value
- ③ Computation

Evaluate $5 - |x|$ if $x = 9$.

$$\begin{aligned} 5 - |x| &= \\ 5 - |9| &= \\ 5 - 9 &= \textcircled{-4} \end{aligned}$$

$$|-x| + 8 \text{ if } x = 3$$

$$|-3| + 8 =$$

$$3 + 8 = 11$$