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If you have played a game and had an “in the hole” or “out of the hole” score, you have used signed numbers.

“in the hole” 12 points can be written: -12 ← Read: negative 12

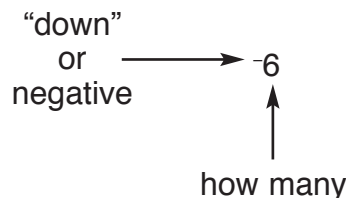
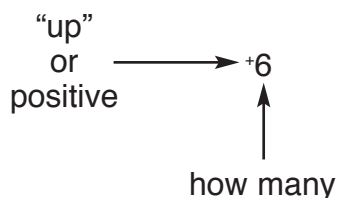
“out of the hole” 10 points can be written: $+10$ or 10 ← Read: positive 10 or 10

Signed numbers can be used to give temperature readings, tell how much money you have or owe, and show a gain or loss.

85° F ← 85 degrees above zero -5 ← You owe \$5. $+2\frac{3}{4}$ ← gain of $2\frac{3}{4}$ points
 -18° F ← 18 degrees below zero $+5$ or 5 ← You have \$5. $-1\frac{1}{2}$ ← loss of $1\frac{1}{2}$ points

Signed numbers show direction. The *number* tells how much or how many. The *sign* tells the direction from zero. Zero is not considered positive or negative.

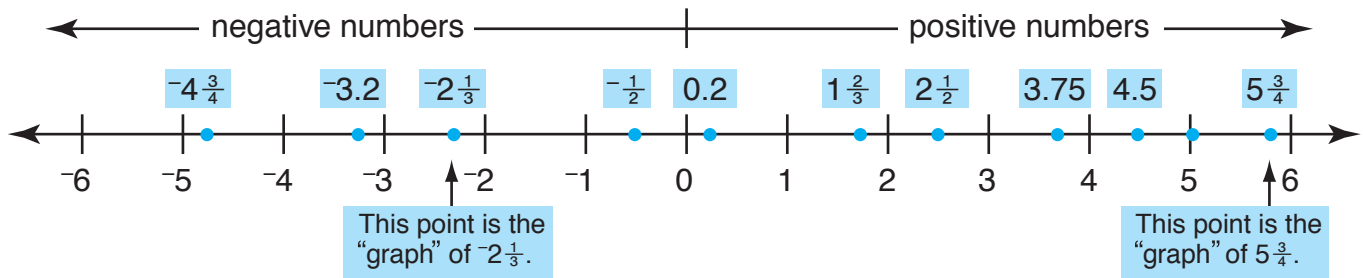
Examples:				
-8	$+3$	$-\frac{1}{2}$	$-6\frac{2}{3}$	0
12	-7.5	$+2.8$	-12	



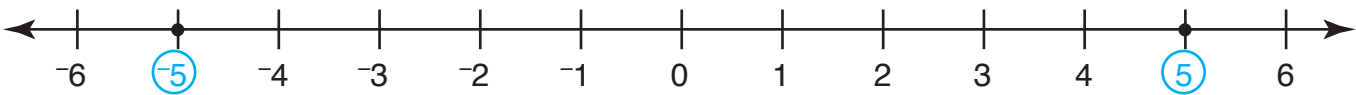
Write a signed number to represent each of the following:

1. a gain of 18 points _____
2. a loss of 6 yards in a football play _____
3. a loss of \$6.75 _____
4. a profit of \$15.75 _____
5. 1.5 minutes after blastoff _____
6. 25 seconds before blastoff _____
7. an elevation of 1000 feet _____
8. a submarine 100 feet below sea level _____
9. 6.5 centimeters above the ground _____
10. 1.2 meters below the surface of the water _____
11. a loss of $\frac{3}{4}$ dollars on a share of stock _____
12. a gain of $1\frac{7}{8}$ dollars on a share of stock _____
13. a deposit to a bank account of \$28.35 _____
14. a withdrawal of \$98.75 from a bank account _____

You can graph signed numbers on a number line. The number line extends to the left and to the right of 0.



A pair of numbers, such as -5 and 5 , that are the same distance from zero but in opposite directions are called **opposites**.

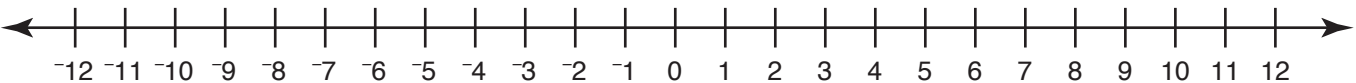


The **absolute value** of a number is its distance from 0.

The symbol for the absolute value of -2 is $|-2|$. ← Read: the absolute value of 2
 The distance of -2 and 2 from 0 are the same. So -2 and 2 have the same absolute value.
 $|-2| = 2$ $|2| = 2$

Graph these numbers on the line below.

1. -3 2. -1 3. $-2\frac{1}{4}$ 4. -2.5 5. $-5\frac{1}{2}$ 6. $\frac{1}{2}$



Write the opposite of each number.

7. -6 _____ 8. 4 _____ 9. -10 _____ 10. -7 _____ 11. 3 _____ 12. -1 _____

Give the absolute value of each number.

13. $|-9|$ _____ 14. $|8|$ _____ 15. $|-8|$ _____ 16. $|3|$ _____ 17. $|6|$ _____ 18. $|-12|$ _____
- _____

Name two numbers that are these distances from zero.

19. 4 units _____ and _____ 20. 7 units _____ and _____

The positive whole numbers (1, 2, 3, ...), negative whole numbers (-1, -2, -3, ...), and 0 make up the set of numbers called **integers**.

You can compare and order integers by looking at their position on a number line. The integer to the left on the number line is the lesser integer. The integer to the right is the greater integer.

Examples:

-5 is to the left of -2 so -5 is less than -2 3 is to the right of -1 so 3 is greater than -1

-5 < -2 is less than 3 > -1 is greater than

-4, 1, -6, 0 in order from least to greatest: -6, -4, 0, 1

Compare. Write < or >.

- | | | | |
|--------------------|--------------------|-----------------------|-------------------------|
| 1. $6 \square 8$ | 5. $-4 \square -8$ | 9. $-2 \square 3$ | 13. $ -7 \square 5 $ |
| 2. $-6 \square -8$ | 6. $-5 \square -7$ | 10. $-12 \square -10$ | 14. $ -8 \square 6 $ |
| 3. $8 \square -6$ | 7. $-11 \square 5$ | 11. $1 \square -5$ | 15. $ -10 \square 4 $ |
| 4. $-8 \square 6$ | 8. $-9 \square 0$ | 12. $-10 \square -9$ | 16. $ -4 \square 5 $ |

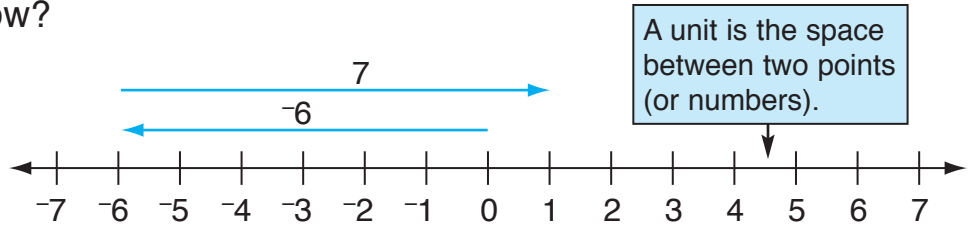
Write in order from least to greatest.

- | | |
|---------------------------|-------------------------------------|
| 17. 4, -6, -9, 2 _____ | 22. -4, 11, -9, -5 _____ |
| 18. -7, 5, -6, 3 _____ | 23. $ -5 $, 1, 3, -8 _____ |
| 19. -10, 2, -8, 5 _____ | 24. -7, 5, $ -4 $, -6 _____ |
| 20. 0, -3, 5, -4, 3 _____ | 25. 0, $ -2 $, 7, $ 3 $, -5 _____ |
| 21. -2, -4, -1, -9 _____ | |

You can use a number line to “add” integers. Start at zero. Move to the left for negative numbers and to the right for positive numbers.

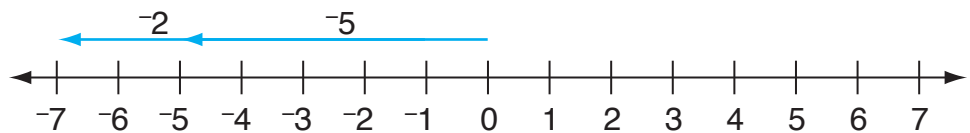
A robot moves 6 units to the left and then 7 units to the right.
Where is the robot now?

$-6 + 7 = \underline{\quad ? \quad}$
Move left 6, then right 7.
The robot is at 1.
 $-6 + 7 = 1$



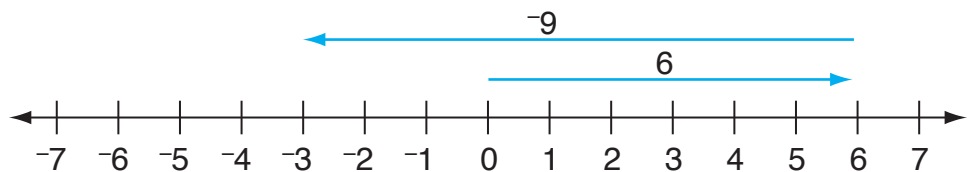
A robot moves 5 units to the left and then 2 more units to the left.
Where is the robot now?

$-5 + -2 = \underline{\quad ? \quad}$
Move left 5, then left 2.
The robot is at -7.
 $-5 + -2 = -7$



A robot moves 6 units to the right and then 9 units to the left.
Where is the robot now?

$6 + -9 = \underline{\quad ? \quad}$
Move right 6, then left 9.
The robot is at -3.
 $6 + -9 = -3$



A robot moves 3 units to the right and then 4 more units to the right.
Where is the robot now?

$3 + 4 = \underline{\quad ? \quad}$
Move right 3, then right 4.
The robot is at 7.
 $3 + 4 = 7$

