

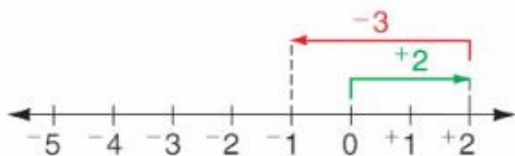
Add Integers

On an oceanographic expedition, the crew took the first sonar reading at 2 km above sea level. The next reading was 3 km below the first reading. What was the depth of the second reading?

To find the depth of the second reading, n , add: $+2 + -3 = n$.

► You can use a number line to model the addition of integers.

- Start at 0.
- Move *right* for positive integers.
- Move *left* for negative integers.



$$+2 + -3 = -1$$

The depth of the second reading was at 1 km below sea level.

► You can also use absolute value to add integers.

To add integers with *like* signs:

- Add the absolute values of the addends.
- Use the sign of the addends for the sum.

$$\begin{aligned} -2 + -4 &= m \\ |-2| + |-4| & \\ 2 + 4 &= 6 \\ -2 + -4 &= -6 \\ m &= -6 \end{aligned}$$

$$\begin{aligned} +5 + +3 &= n \\ |+5| + |+3| & \\ 5 + 3 &= 8 \\ +5 + +3 &= +8 \\ n &= +8 \end{aligned}$$

To add integers with *unlike* signs:

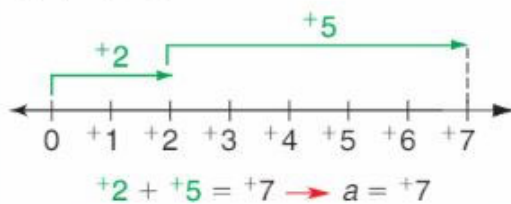
- Subtract the addend with the lesser absolute value from the addend with the greater absolute value.
- Use the sign of the addend with the greater absolute value for the sum.

$$\begin{aligned} +5 + -8 &= d \\ |-8| - |5| & \\ 8 - 5 &= 3 \\ 5 + -8 &= -3 \\ d &= -3 \end{aligned}$$

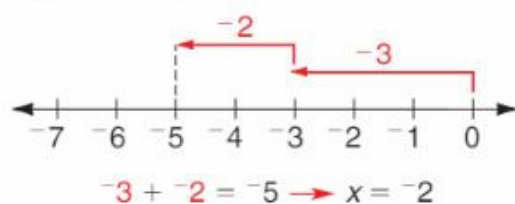
$$\begin{aligned} +9 + -7 &= s \\ |+9| - |-7| & \\ 9 - 7 &= 2 \\ +9 + -7 &= +2 \\ s &= +2 \end{aligned}$$

Study these examples.

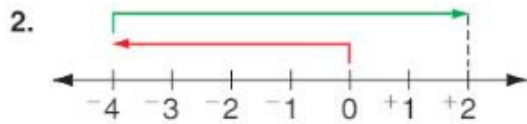
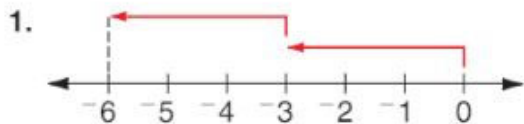
$$+2 + +5 = a$$



$$-3 + x = -5$$



Write an addition sentence that is modeled by each number line.



Add. Use a number line to help.

3. $+2 + +1$

4. $-4 + -3$

5. $-1 + -4$

6. $+6 + +1$

7. $-6 + +4$

8. $+7 + -5$

9. $-5 + -6$

10. $+4 + +4$

11. $-4 + +8$

12. $-8 + +5$

13. $+6 + 0$

14. $0 + -8$

15. $+4 + -5 + -6$

16. $-6 + -2 + +4$

17. $-3 + -3 + -3$

18. $-2 + -2 + -2$

19. $+7 + -5 + -2$

20. $-8 + +6 + +9$

Find the value of the variable.

21. $+7 + a = +16$

22. $-5 + b = +3$

23. $+11 + c = +9$

24. $d + +7 = -7$

25. $e + -8 = -13$

26. $f + -15 = -12$

27. $+9 + k = 0$

28. $h + 7 = -6$

29. $-13 + i = -15$

Problem Solving


30. On Monday Sally deposited \$60 in her savings account. On Tuesday she withdrew \$45. What was the net change in savings for the two days?

31. In January Raul lost 5 pounds. He gained back 3 pounds in February. What was his total weight gain or loss for the two months?

32. Rita started a checking account with \$500. She later wrote a check for \$50, made a deposit of \$250, and wrote another check for \$100. How much money was left in Rita's account?

33. An elevator starts at the 23rd floor, goes down 5 floors and then up 8 floors. At what floor is it then? Draw a vertical number line to illustrate.

Write About It

34.  Explain in your Math Journal how you can use the rules on page 154 for adding with zeros (such as $0 + -7$) or with opposites (such as $+7 + -7$).