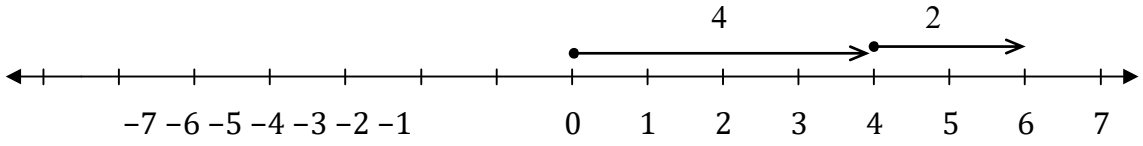
Adding Integers

Integers can be added using the number line. This is generally not necessary when both integers are positive, but can be very helpful when one or more of the integers is negative.

We will begin at zero. You will notice that the addition of a positive number is shown by an arrow going in the **positive** direction and the addition of a negative number is shown by an arrow going in the **negative** direction.

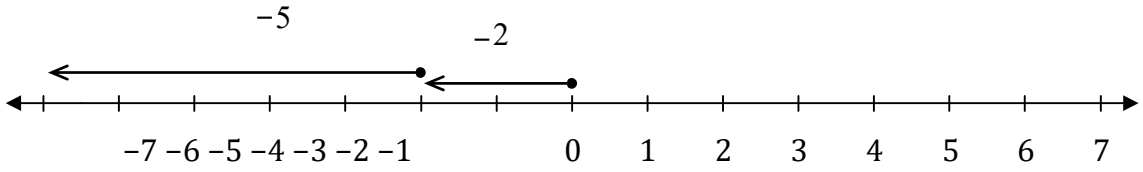
Let's look at some examples.

Example 1 $4 + 2 = 6$



If we start with positive 4 and travel 2 more units in the positive direction, we end at positive 6. The sum of two **positive** numbers is **positive.**

Example 2 $-2 + (-5) = -7$



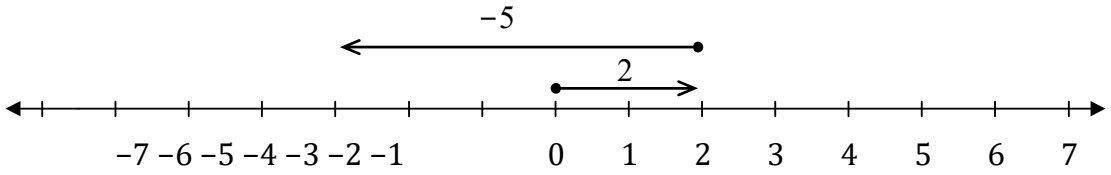
If we start with -2 and travel 5 more units in the negative direction, we end at -7. The sum of two **negative** numbers is **negative.**

Rule for adding numbers with the same sign.

To add numbers with the same sign, add the absolute values of the numbers. Then attach the sign of the addends.

Now let's consider adding two numbers with different signs.

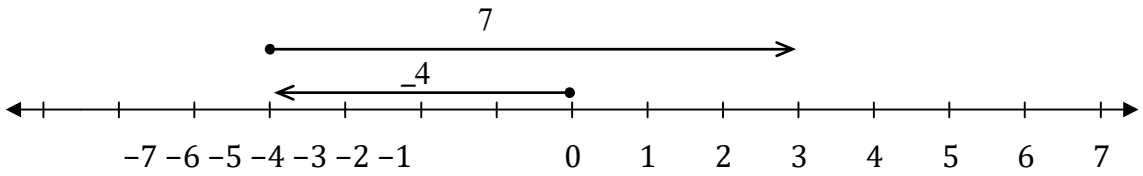
Example 3 $2 + (-5) = -3$



When we add positive 2 and negative 5, we first travel 2 units in the positive direction and then turn around and travel 5 units in the negative direction, ending at negative 3. Negative 3 is three units from zero. Three units is also the difference in the lengths of the lines. It is, therefore, the difference in the absolute values of −5 and 2. (REMEMBER that absolute value measures distance.)

However, because we ended on the negative side of zero the sum is −3.

Example 4 − + =4 7 3



When we add negative 4 and positive 7, we first travel 4 units in the negative direction and then turn around and travel 7 units in the positive direction, ending at positive 3.Three units is also the difference in the lengths of the lines. It is therefore the difference in the absolute values of 7 and −4. (**REMEMBER** that absolute value measures distance.)

Because we ended on the positive side of zero, the sum is 3.

The sum of two numbers with **different** signs can be **negative** or **positive.**

Rule for adding numbers with different signs.

To add numbers with different signs, find the difference between the absolute values of the numbers. Attach the sign of the number with the greater absolute value.

Examples

$-22 + 14 = -(22 - 14)$ The number with the greater absolute value is negative.

$= -8$

$-16 + 32 = (32 - 16)$ The number with the greater absolute value is positive.

$= 16$

REMEMBER to subtract the smaller absolute value from the larger absolute value and keep the sign of the "BIGGER" distance.

EXERCISES Add each of the following

1. $-3 + (-8)$ 6. $-18 + (-23)$

2. $-15 + (-47)$

3. $3 + (-12)$

4. $-4 + 18$

5. $-24 + 9$

7. $8 + (-42)$

8. $-2 + (-6) + 14$

9. $-9 + 9$

10. $5 + 10 + (-12)$

KEY

1. -11
2. -62
3. -9
4. 14
5. -15
6. -41
7. -34
8. 6
9. 0
10. 3