

3.3 – Subtracting Integers

Once we have learned how to add and find opposites of integers, it is easy to subtract them. Every subtraction problem has the same answer as an addition problem.

$$\begin{cases} 8 - 5 = 3 \\ 8 +^{-}5 = 3 \end{cases} \quad \begin{cases} 10 - 1 = 9 \\ 10 +^{-}1 = 9 \end{cases}$$

To find the answer to a subtraction problem, all we have to do is change it to an addition problem — but instead of subtracting the second number we *add the opposite of the second number*.

Here is another example: $-5 - 4 =$

Instead of subtracting positive 4 we are going to add negative 4; so here's how you can change the problem:

$$-5 +^{-}4 =$$

Now the problem is just like the adding problems we have already done. A loss of 5 and a loss of 4 comes out to a loss of 9:

$$-5 +^{-}4 = -9$$

Below are some more subtraction problems. Change each problem to an addition problem. Remember to add the *opposite* of the *second number*.

$6 +^{-}8 = -2$

$4 - 9 =$

$-4 - 8 =$

$-5 - 3 =$

$5 - 9 =$

$-9 - 4 =$

$8 - 5 =$

$4 - 7 =$

$-3 - 6 =$

$7 - 2 =$

$-8 - 8 =$

$-1 - 6 =$

In this subtraction problem the number being subtracted is negative:

$$7 - -5 =$$

First we have to change the problem. We have to add the opposite of the second number, so instead of subtracting negative 5 we are going to add positive 5:

$$7 + +5 =$$

A gain of 7 and a gain of 5 is the same as a gain of 12:

$$7 + +5 = 12$$

If this seems strange to you, think of the football field. When the referee takes away or rules out a 5 yard loss, we gain back the 5 yards.

Subtract.

$$-3 + +7 = 4$$

$$5 - -9 =$$

$$8 - -3 =$$

$$-6 - -4 =$$

$$-9 - -6 =$$

$$-8 - -8 =$$

$$10 - -5 =$$

$$-10 - -5 =$$

$$2 - -9 =$$

$$-2 - -9 =$$

Be careful on these.

$$6 - -8 =$$

$$6 - 8 =$$

$$-6 - -8 =$$

$$-6 - 8 =$$

As you can see, every time we have a subtraction problem, we can change it to an adding problem. But we have to remember to *add the opposite* of the second number:

If a and b are integers, then $a - b = a + -b$.

Subtract. Remember to add the *opposite* of the second number.
 (If the second number is positive, change it to negative.
 If the second number is negative, change it to positive.)

$4 - 2 =$	$5 - -3 =$	$-3 - -4 =$	$-6 - 2 =$
$-6 - -3 =$	$4 - 5 =$	$-3 - -7 =$	$7 - 6 =$
$8 - -5 =$	$-9 - -2 =$	$-2 - 7 =$	$8 - -4 =$
$-5 - -3 =$	$5 - 9 =$	$2 - -7 =$	$9 - -7 =$
$-8 - 8 =$	$-5 - -8 =$	$1 - 9 =$	$-7 - -7 =$
$8 - -3 =$	$-9 - 4 =$	$-8 - -3 =$	$7 - 9 =$
$-6 - -5 =$	$10 - -8 =$	$-12 - -4 =$	$-11 - 5 =$
$12 - -6 =$	$11 - -2 =$	$0 - 5 =$	$-1 - 1 =$
$-11 - 0 =$	$13 - -9 =$	$-15 - -6 =$	$17 - -8 =$
$-16 - 7 =$	$-13 - 5 =$	$18 - -9 =$	$-14 - 14 =$
$14 - -5 =$	$8 - 9 =$	$4 - 8 =$	$0 - -6 =$
$-10 - 10 =$	$-1 - -8 =$	$7 - 7 =$	$-14 - -4 =$

Subtract.

(Remember . . .
 add the opposite of
 the bottom number.)

$$\begin{array}{r} -5 \\ - -6 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - -9 \\ \hline \end{array}$$

$$\begin{array}{r} 2 \\ - 6 \\ \hline \end{array}$$

$$\begin{array}{r} -8 \\ - -4 \\ \hline \end{array}$$

$$\begin{array}{r} 6 \\ - -9 \\ \hline \end{array}$$

$$\begin{array}{r} -11 \\ - 4 \\ \hline \end{array}$$

$$\begin{array}{r} 14 \\ - -8 \\ \hline \end{array}$$

$$\begin{array}{r} 16 \\ - 13 \\ \hline \end{array}$$

$$\begin{array}{r} -16 \\ - -13 \\ \hline \end{array}$$

$$\begin{array}{r} -10 \\ - 10 \\ \hline \end{array}$$