TSC | WILLIAM D. LAW, JR. LEARNING COMMONS

Subtracting Integers

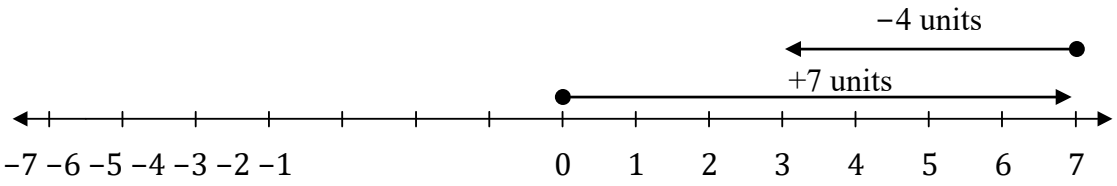
Subtraction of an integer is defined as addition of the opposite integer. This means that we rewrite each subtraction problem as an equivalent addition problem. If all we changed was the operation the problem would not be equivalent. We must also change the second number to its opposite.

EXAMPLE: $7 - 4 = 7 + (-4)$

Let us look at $7 - 4$ and $7 + (-4)$ on the number line

Beginning at 7, if we subtract 4 from seven we must travel 4 places in the negative direction, ending at positive 3.

$$7 - 4 = 3$$



To add 7 and -4, we first travel 7 units in the positive direction and then turn around and go 4 units in the negative direction, ending at positive 3.

$$7 + (-4) = +3$$

This means that subtraction of a number and addition of the *opposite* number are the same thing.

REMEMBER that to subtract two integers follow these steps:

1. Keep the first number the same
2. Change the operation of subtraction to addition
3. At the same time change the second integer to its opposite
4. Add the two numbers, following the rules for addition

Study the following examples.

$-8 - 15 = -8 + (-15) = -(8 + 15) = -23$

$-5 - (-12) = -5 + {}^{+}12 = +(12 - 5) = 7$

$13 - 27 = 13 + (-27) = -(27) + 13 = -14$

$12 - (-16) = 12 + {}^{+}16 = (12 + 16) = 28$

You will sometimes have more than two integers in a subtraction problem.

> REMEMBER to change all subtractions to the addition of the opposite number before you begin.

$-2 - 5 - (-7) - 9 - 5 - (-6)$
$-2 + (-5) + 7 + (-9) + (-5) + 6$
$-7 + 7 + (-9) + (-5) + 6$
$0 + (-9) + (-5) + 6$
$(-9) + (-5) + 6$
$(-14) + 6$
-8

> NOTE that the negative on the first number indicates that 2 is <u>negative</u>. It is <u>not</u> a subtraction sign. A subtraction sign must be <u>between</u> two numbers.

EXCERCISES: Subtract

1. $8 - 14$
2. $-8 - 12$
3. $5 - (-6)$
4. $-12 - (-17)$
5. $-2 - 11$
6. $-8 - 4 - 6$
7. $-10 - (-3) - (-6)$
8. $5 - 4 - (-10) - 15$
9. $2 - (-6) - (-7) - (-10)$
10. $-3 - 9 - 4 - 11 - 12$

KEY:

1. -6 2. -20 3. 11 4. 5 5. -13 6. -18 7. -1 8. -4 9. 25 10. -39