

Subtracting Integers

Guided Notes

Subtraction of integers can be written as the addition of the opposite number.

To subtract two integers, rewrite the subtraction expression as the first number plus the opposite of the second number.

This can be written symbolically as: $a - b = a + (-b)$.

When subtraction occurs several times in an expression, rewrite each subtraction as addition of the opposite and then add.

Rule:

The sign of the first number stays the same, change subtraction to addition and change the sign of the second number. Once you have applied this rule, follow the rules for adding integers.

Same-Change-Change (SCC)

$(+) - (+) = (+) + (-)$ SCC, then subtract, take the sign of the bigger number.

$(-) - (-) = (-) + (+)$ SCC, then subtract, take the sign of the bigger number.

$(+) - (-) = (+) + (+)$ SCC, then add, answer is positive

$(-) - (+) = (-) + (-)$ SCC, then add, answer is negative If the signs are the same, add and keep the same sign.

Sample Problem 1: Find the difference.

a. $13 - 16 =$

$$\begin{aligned} & 13 - 16 = \\ & = 13 + (-16) = \\ & = -3 \end{aligned}$$

b. $(-44) - (-14) =$

$$\begin{aligned} & (-44) - (-14) = \\ & = (-44) + 14 = \\ & = -30 \end{aligned}$$

c. $16 - 89 =$

$$\begin{aligned} & 16 - 89 = \\ & = 16 + (-89) = \\ & = -73 \end{aligned}$$

d. $-45 - 83 =$

$$\begin{aligned} & -45 - 83 = \\ & = -45 + (-83) = \\ & = -128 \end{aligned}$$

Using the Number Line to Subtract Integers

You can model the difference between two integers using a number line.

When you subtract a positive number, the difference is less than the original number, so you move to the **left**.

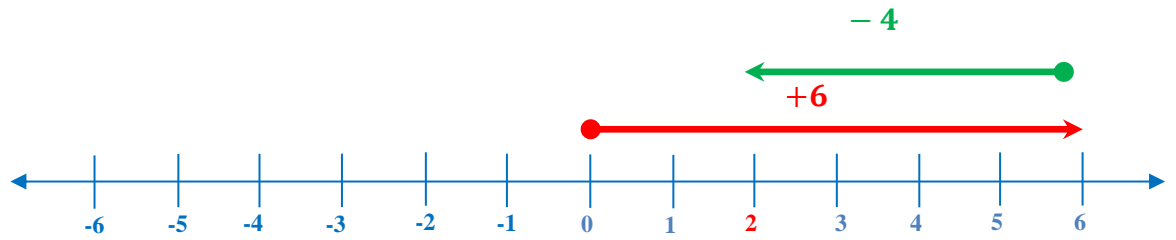
To subtract a negative number do the opposite: move to the **right**.



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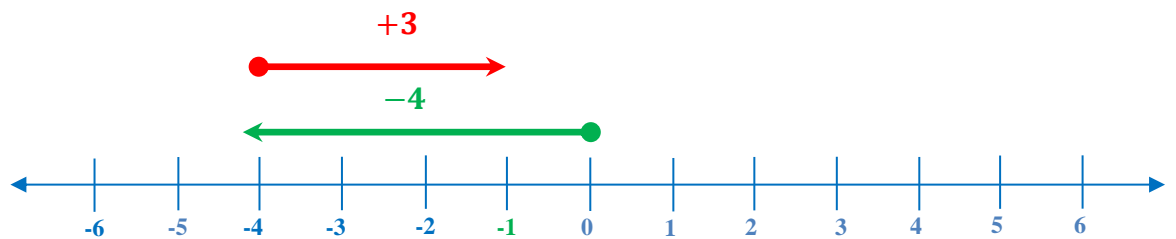
Sample Problem 2: Use a number line to find each difference.

a. $6 - 4 =$



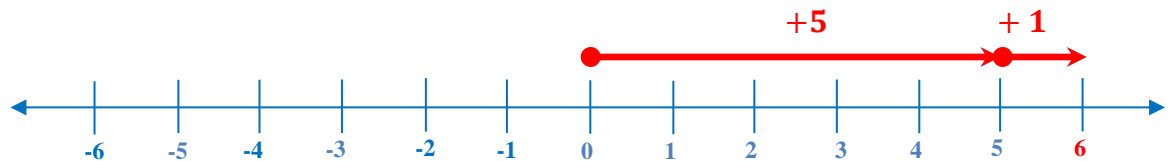
$$\begin{aligned} 6 - 4 &= \\ &= 6 + (-4) = \\ &= 2 \end{aligned}$$

b. $(-4) - (-3) =$



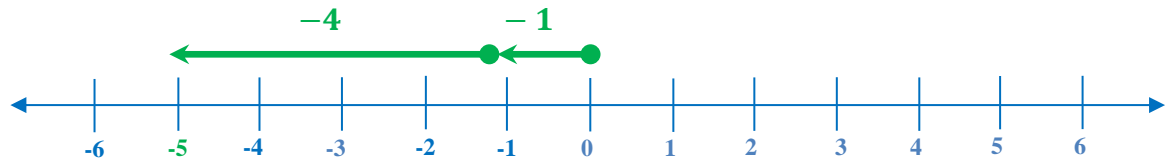
$$\begin{aligned} (-4) - (-3) &= \\ &= (-4) + 3 = \\ &= -1 \end{aligned}$$

c. $5 - (-1) =$



$$\begin{aligned} 5 - (-1) &= \\ &= 5 + 1 = \\ &= 6 \end{aligned}$$

d. $-1 - 4 =$



$$\begin{aligned} -1 - 4 &= \\ &= -1 + (-4) = \\ &= -5 \end{aligned}$$

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Sample Problem 3: Solve each expression below.

a. $(-15) - (-14) - 12 =$

$$\begin{aligned} & (-15) - (-14) - 12 = \\ & = (-15) + 14 - 12 = \\ & = -1 - 12 = \\ & = -1 + (-12) = \\ & = -13 \end{aligned}$$

b. $81 - 25 - (-34) =$

$$\begin{aligned} & 81 - 25 - (-34) = \\ & = 81 + (-25) - (-34) = \\ & = 56 - (-34) = \\ & = 56 + 34 = \\ & = 90 \end{aligned}$$

c. $[-2 - 26]^2 - (-50) - 23 =$

$$\begin{aligned} & [-2 - 26]^2 - (-50) - 23 = \\ & = [-2 + (-26)]^2 - (-50) - 23 = \\ & = [-28]^2 - (-50) - 23 = \\ & = 784 - (-50) - 23 = \\ & = 784 + 50 - 23 = \\ & = 834 - 23 = \\ & = 834 + (-23) = \\ & = 811 \end{aligned}$$

Sample Problem 4: Solve each expression below.

a. $(-132) + (-104) - 100 =$

$$\begin{aligned} & (-132) + (-104) - 100 = \\ & = (-236) - 100 = \\ & = (-236) + (-100) = \\ & = -336 \end{aligned}$$

b. $162 - 122 + (-40) =$

$$\begin{aligned} & 162 - 122 + (-40) = \\ & = 162 + (-122) + (-40) = \\ & = 40 + (-40) = \\ & = 0 \end{aligned}$$

c. $[32 - 36]^2 - [-12 + 4]^2 =$

$$\begin{aligned} & [32 - 36]^2 - [-12 + 4]^2 = \\ & = [32 + (-36)]^2 - [-12 + 4]^2 = \\ & = [-4]^2 - [-8]^2 = \\ & = 16 - 64 = \\ & = 16 + (-64) = \\ & = -48 \end{aligned}$$