

2-4-1 Subtraction of Real Numbers

Rule: To subtract ADD the OPPOSITE.

This sounds easy.

Think about a problem $3 - 6$. The operation in this problem is subtraction. The 6 is positive.

To follow the rule change the subtraction operation to addition and the positive 6 to a negative 6 .

The result is $3 + (-6)$. Now follow the addition rules to get a result of -3 .

It may be easier to think UP 3 DOWN 6 from the original $3-6$ to arrive at -3 .

The word *minus* can be used as a verb or an adjective in an equation.

It can mean to subtract or denote a negative number.

Example: $-5.6 - (-3)$ ADD the OPPOSITE $-5.6 + (3) = -2.6$

Notice the subtraction operation changed to addition, and the opposite of -3 becomes 3 .

$-3.2 - 2.5$ ADD the OPPOSITE $-3.2 + (-2.5) = -5.7$

The $-$ in front of the 2.5 is a verb. It is a subtraction and this is what is changed to addition.

The $-$ in front of the 3.2 is an adjective. It tells what kind of number 3.2 is.

An easy way to do these problems without writing down the new addition problem is think "UP" and "DOWN" at the appropriate time.

$-2/3 - 1/4$ Think: Down $2/3$ down $1/4$ more. Get a common denominator.

$8/12$ down and $3/12$ down is $-11/12$.

$3-8$ Think: UP 3 then Down 8 for 5 in the hole. $3-8 = -5$

$-81-12$ Think Down 81 then Down 12 more. $-81 -12 = -93$.

When two negative are next to each other, you must write the new addition problem on paper.

$5 - (-3)$ ADD the OPPOSITE $5 + (+3)$ Notice the use of the rule. $5 - (-3) = 5 + 3 = 8$

$-8 - (-4)$ ADD the OPPOSITE $-8 + (+4)$. Now think Down 8 then up 4 . $-8 - (-4) = -8 + 4 = -4$

When double negatives are in long lines of addition and subtraction, you must write the new addition.

However, you only need to change the double negative.

Example: $-7-9-(-4)-3+9-(-4)$ Changes on paper to $-7-9+4-3+9+4$.

Then think DOWN 7 , Down 9 more, then UP 4 , Down 3 , UP 9 , and UP 4 . The result is -2 .

Practice:

a) $5-8$ $81-43$ $-23-24$ $-34-(-21)$ $-3-(-8)$ $-8x-12x$

b) $-3x-4x-2x+x$ $-7e+3e-10e+3e-2e-2e$ $-6a-(-3a)-(-2a)-8a+2a-12a-6a$

c) $-d-(-3d)+7d-3d-(-5d)$ $2c-3b+5c-3c-(-3b)$ $-4r-(-3r)-9r-3r+2r+r-6s+8s$

d) $\frac{w}{3} - \left(-\frac{2w}{3}\right) - \frac{3w}{4} - \frac{5w}{6}$ $4\frac{1}{3}a - \left(-5\frac{2}{3}b\right) - \frac{3}{4}b - \frac{5}{6}a - 3a + 7b$