Adding Real Numbers

There are many different ways to look at adding real numbers.

Number Line Counters/Chips Rules involving Absolute Value

Here is my suggestion. Use two questions.

1. Are there more positives or negatives?
This determines the sign of your answer.

2. How many more?
This determines the quantity of your answer.

Ex 1: $-8+3$

-5

Ex 2: $-4+(-3)$

-7

Ex 3: $23+(-23)$

0

Ex 4: $-2\frac{1}{2}+1\frac{3}{4}$

$-2\frac{2}{4}+1\frac{3}{4}$

$-1\frac{6}{4}+1\frac{3}{4}$

$-\frac{3}{4}$

For #5 through 7, x = -3 and y = 12.

Ex 5: $x+8+(-25)-y$

$-3+8+(-25)+12$

$5+(-25)+12$

$-20+12$

-8

Ex 6: $|x|+(-10)+y$

$|-3|+(-10)+12$

$3+(-10)+12$

$-7+12$

5

Ex 7: $x+|x+1|+y$

$-3+|-3+1|+12$

$-3+|-2|+12$

$-3+2+12$

$-1+12$

11

My son told me that if I added two numbers together, I would always get a bigger number.

Is he correct? Algebraically, that thought can be expressed as the following inequality.

Statement #1: $a+b>a$ Is this sometimes true, always true, or never true?

Sometimes

$a+b>a$ Example: $5+2>5$ $[b>0]$

$a+b<a$ Example: $5+(-2)<5$ $[b<0]$

$a+b=a$ Example: $5+0=5$ $[b=0]$

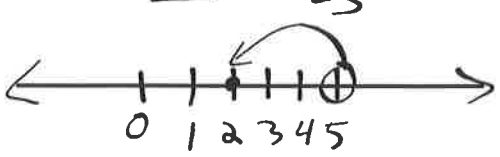
Subtracting Real Numbers

Main Idea: Equivalent expressions have the same value.

Model the following expressions on a number line.

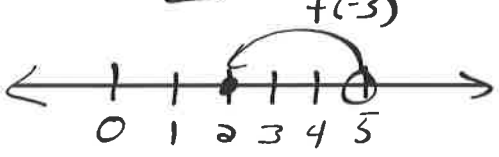
$5-3$

2



$5+(-3)$

2



Since the two expressions have the same value, they are equivalent. A subtraction problem can always be rewritten as an equivalent addition problem.

To subtract real numbers, change subtraction to "adding the opposite".

Ex 1: $-6-6$

$-6+(-6)$

$\boxed{-12}$

Ex 2: $3+5-18$

$3+5+(-18)$

$8+(-18)$

$\boxed{-10}$

Ex 3: $-7.4-(-5)$

$-7.4+5$

$\boxed{-2.4}$

Ex 4: $-5+7-8$

$-5+7+(-8)$

$2+(-8)$

$\boxed{-6}$

Ex 5: $9-12-(-3)$

$9+(-12)+3$

$-3+3$

$\boxed{0}$

Ex 6: $-6+3\frac{1}{3}-5\frac{1}{2}$

$-6+3\frac{2}{6}+(-5\frac{3}{6})$

$-2\frac{4}{6}+(-5\frac{3}{6})$

$-7\frac{7}{6}$

$\boxed{-8\frac{1}{6}}$

Evaluate if x = -5 and y = 2.3.

Ex 7: $x+3(-6+2(10))$

$-5+3(-6+2(10))$

$-5+3(-6+20)$

$-5+3(14)$

$-5+42$

$\boxed{37}$

Ex 8: $-6.4+y(y-(-0.7))$

$-6.4+2.3(2.3-(-0.7))$

$-6.4+2.3(2.3+0.7)$

$-6.4+2.3(3)$

$-6.4+6.9$

$\boxed{.5}$

My son told me that if I subtracted a number from another, I would always get a smaller number.

Is he correct? Algebraically, that thought can be expressed as the following inequality.

Statement #2: $a - b < a$ Is this sometimes true, always true, or never true?

Sometimes

$a - b < a$ Example: $6 - 4 < 6$ $[b > 0]$

$2 < 6$

$a - b > a$ Example: $6 - (-4) > 6$ $[b < 0]$

$6 + 4 > 6$

$10 > 6$

$a - b = a$ Example: $6 - 0 = 6$ $[b = 0]$

Assignment #5

Part I: p. 77 #3-23 odd, 33-43 odd

Part II: p. 82-83 #3-25 odd, 32-34