1. Calculate $6 + (-14)$ → two numbers in opposite directions → subtract to 8; −14 dominates → -8

2. Calculate $8 + (-5) = 3$

3. Calculate $-8 + (-5) + 10 = -13 + 10 = -3$

4. Calculate $-12 + 5 + 4 + (-2) = -7 + 4 + (-2) = -3 + (-2) = -5$

5. Simplify $-\frac{9}{10} + \frac{1}{4}$ → common denominator 20, 40, 60, 80, ...

$\frac{-9}{10} \cdot \frac{2}{2} + \frac{1}{4} \cdot \frac{5}{5}$

$= \frac{-18}{20} + \frac{5}{20} = \frac{-13}{20}$

6. Simplify $-\frac{1}{5} + \frac{3}{10} = \frac{1}{10}$

7. Simplify $-\frac{2}{3} + \frac{1}{4} =$

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

$= \frac{-8}{12} + \frac{3}{12}$

$= \frac{-5}{12}$

8. Simplify $8x + (-9x)$

9. Simplify $-2x + x$

10. Simplify $-2x + 5x + (-6x)$

11. Simplify $-6x + 10 + 8x + (-12)$

12. Simplify $5x + (-7) + (-8x) + (-2)$

8. $= -1 \cdot x$

$= -x$

9. $= -1 \cdot x$

$= -x$

10. $-2x + 5x + (-6x)$

$= 3x + (-6x)$

$= -3x$

11. $-6x + 10 + 8x + (-12)$

$= 2x + 10 + (-12)$

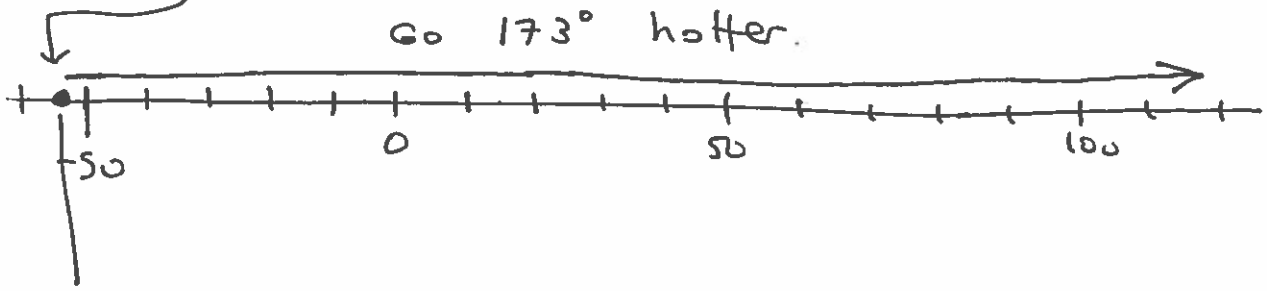
$= 2x + (-2)$

$= 2x - 2$

12. $-3x + (-9)$

$= -3x - 9$

Ex The lowest temp ever recorded in Oregon was $-54°F$. The highest temp was $173°$ above this. What was that highest temp.?



$-54 + 173 = 119$ → So the highest recorded temp in OR was $119°F$.

Ex A company spent 3.25 million dollars and earned 2.6 million dollars one year, making a deficit. How much was the deficit?

$-3.25 + 2.6 = -0.65$

opposite directions (neg dominates)

$$\begin{array}{r} {}^{2}\cancel{3}{}^{12}\cancel{.}25 \\ -\ 2.6 \\ \hline 0.65 \end{array}$$

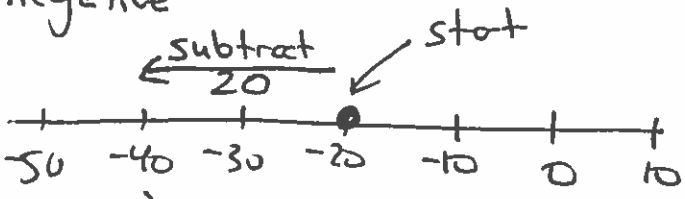
1.6 Subtracting (with Negative Numbers)

Ex $-20 - 20$

look the same, but are not!

-20 negative, $-$ subtraction

(~~MINUS~~)



$= -40$

Alternative:

Subtraction ↔ Adding a Negative

$-20 - 20$

$= -20 + (-20)$

$= -40$

start -20 — go left 20

Ex $20 - (-20)$

Subtract a negative (minus minus) adding a pos (change to +)

$= 20 + 20$

$= 40$

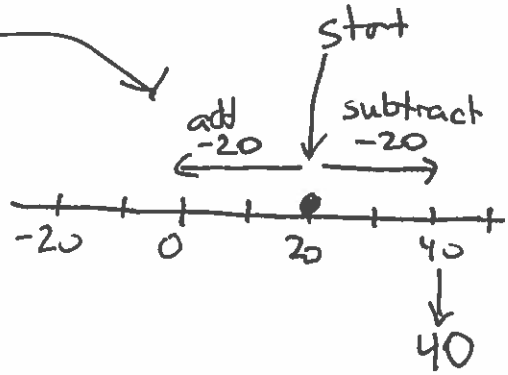
$20 - (-20)$

change to add opposite

$= 20 + (\text{opp. of } -20)$

$= 20 + 20$

$= 40$



Ex $-20 - (-20)$

$= 0$

$-20 - (-20)$

$= -20 + 20$

$= 0$

$-20 - (-20)$

$\square - \square = 0$

Ex $-10 - 24$

$= -10 + (-24)$

two numbers in same direction

$= -34$

-7 negative $\quad -7$ subtract 7

Ask is there anything to the left?

$-10 - 24$

negative sign because nothing to left.

has a number to its left, so it's subtraction

Ex $6 - (-14)$

subtraction! negative!

$= 6 + 14$

add the opp of -14

$= 20$

Ex $\frac{3}{8} - \left(-\frac{1}{8}\right) = \frac{3}{8} + \frac{1}{8}$

subtraction neg. (nothing to its left)

$= \frac{4}{8}$

$= \frac{1}{2}$

Ex $\frac{-3}{4} - \frac{5}{4} = \frac{-3}{4} + \left(-\frac{5}{4}\right)$

subtraction

$= \frac{-8}{4}$

$= -2$

Ex $-\frac{1}{2} - \left(-\frac{3}{4}\right) = \frac{-1}{2} + \frac{3}{4}$

one subtraction sign, two neg. signs.

leave alone

replacing subtraction

opposite of $-\frac{3}{4}$

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

$= \frac{-2}{4} + \frac{3}{4}$ (opp direction, pos wins)

$= \frac{1}{4}$

Ex $\frac{-9}{10} - \frac{1}{4}$ this time, for variety, make common denom first.

$= \frac{-9}{10} \cdot \frac{2}{2} - \frac{1}{4} \cdot \frac{5}{5}$

$= \frac{-18}{20} - \frac{5}{20}$

$= \frac{-18}{20} + \text{opposite of } 5/20$

leave alone

$= \frac{-18}{20} + \left(\frac{-5}{20}\right)$ (same direction, negative)

$= -\frac{23}{20}$

Ex $-12x - 15x = -12x + (-15x)$

one sub. sign

one neg. sign

leave alone

add opposite

$=$ two quantities added in same direction

$= -27x$

Ex $-6x - (-4x) = -6x + 4x$

Change to an addition!

(Opposite directions → differences is 2 but neg # wins, so --- -2

$= -2x$

Ex $-6x - 10 + 8x - 12$

like like

Change all subtractions to adding opposites

$= -6x + (-10) + 8x + (-12)$ (Now all addition!)

$= 2x + (-22)$

$= 2x - 22$

subtraction.

Ex $5x - (-7) - 8x - 2$

(like, like)

(subtraction signs: 3
negative signs: 1)

All subtraction → adding opposite.

$= 5x + 7 + (-8x) + (-2)$

(Now all addition!)

$= -3x + 5$