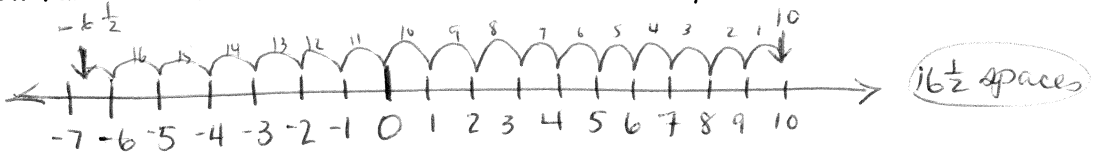
Key #2

Distance

There are many ways to find the distance between two numbers... Let's use this as the example for each one: Find the distance between $-6\frac{1}{2}$ and 10.

Method One...
Draw a number line and "count" the spaces between the two numbers on the number line. Depending on how far the numbers are from each other this may not be the most efficient method!!!



Method Two...
Subtract the lesser number from the greater number.

$$10 - -6\tfrac{1}{2} = 10 + +6\tfrac{1}{2} = 16\tfrac{1}{2}$$

Method Three...
Find the absolute value of the difference between the two numbers. (*I like this method because you do not need to remember which number to place first.)*

$$\left|10 - -6\tfrac{1}{2}\right| = \left|16\tfrac{1}{2}\right| = 16\tfrac{1}{2} \quad \text{OR} \quad \left|-6\tfrac{1}{2} - 10\right| \left|-6\tfrac{1}{2} + +10\right| \left|-16\tfrac{1}{2}\right| = 16\tfrac{1}{2}$$

Examples...

#1 A submarine is three miles below sea level. A weather balloon is 50,000 feet above sea level. How far apart are the submarine and the weather balloon? (Fact: 5280 ft. = 1 mile.)

$3 \times 5280 = 15840$

$$|50{,}000 - -15{,}840| = |50{,}000 + +15{,}840| = |65{,}840|$$

also show a sketch

The sub + the balloon are 65,840 ft. apart from each other!

#2 John was $3.75 in debt. Mary was fifty cents ahead. John found money in an envelope and after that he had the same amount of money as Mary. How much money was in the envelope?

$-3.75 + X = +50¢$

$+3.75 \quad +3.75$

$X = \$4.25$

John found $4.25 in the envelope!

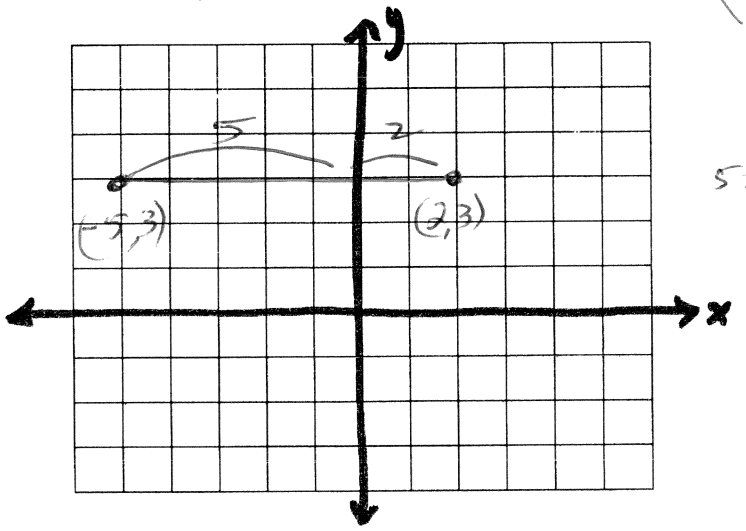
#3 Ocean water freezes at about $-2\frac{1}{2}°C$. Fresh water freezes at 0°C. Antifreeze, a liquid used to cool most car engines, freezes at -64°C. Imagine that the temperature is exactly at the freezing point for ocean water. How many degrees must the temperature drop for the antifreeze to turn to ice?

$-2\frac{1}{2} - x = -64°C$

$64 - 2\frac{1}{2} = 61\frac{1}{2}°$

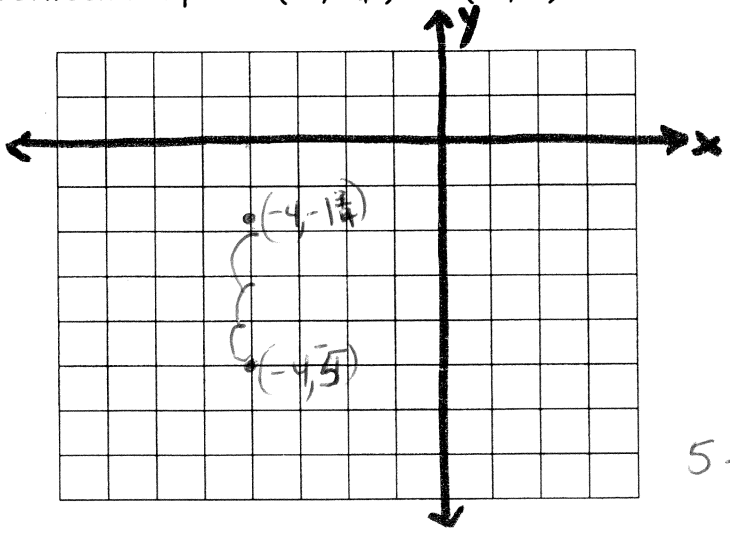
The temp must drop $61\frac{1}{2}°C$,

#4 Find the distance between the points (2,3) and (-5,3) on the coordinate plane.



$5 + 2 = 7$

#5 Find the distance between the points $(-4,-1\frac{3}{4})$ and (-4,-5) on the coordinate plane.



$5 - 1\frac{3}{4} = 3\frac{1}{4}$