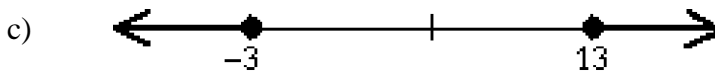
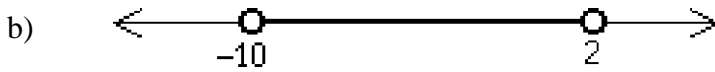
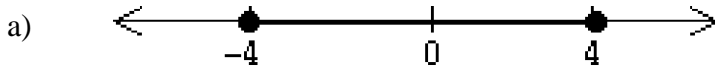


- 1) In how many different ways can the letters in the following words be arranged? To show your work, either list the arrangements or state some calculation you made. Be careful on parts d), e), and f) as you must account for the duplication of letters.
- a) "and" b) "base" c) "sweat"
d) "add" e) "bass" f) "tweet"
- 2) Graph on a number line:
- (a) $(-6, 4) \cup ([6, 10]) \cap [3, 9)$ (b) $((-6, 4) \cup [6, 10)) \cap [3, 9)$
- 3) In $\triangle PQR$, $P = (5, 8)$, $Q = (-7, 4)$, $R = (3, -10)$.
- a) Find the equation of the median from Q to PR in slope intercept form.
b) Find the exact length of the median from Q to PR .
c) Find the equation of the altitude from R to PQ in slope intercept form.
d) Find the intersection point of the median in (a) and the altitude in (c)
- 4) The solution set of $ax^2 + b = cx$ is $\{2, 7\}$.
Find the solution set of $a(x-3)^2 + b = c(x-3)$.
(Think! Don't multiply it out!)
- 5) In how many ways can you form a numeral between 300 and 799 using only the digits 2, 3, 5, 6, 7, 8 under each condition:
- a) Any digit may appear more than once.
b) No digit may be repeated.
c) The numeral must be even.
d) No digit may be repeated and the numeral must be even.
- 6) **NC** $\triangle ABC$ is rotated 90° about the origin by the matrix $r_{90} = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ into $\triangle A'B'C'$, whose vertex matrix is $\begin{bmatrix} -5 & 9 & 3 \\ 2 & 3 & 12 \end{bmatrix}$. Find the vertex matrix of $\triangle ABC$.

7) Use absolute value notation to describe each of these graphs:



8) The domain of function f is $[-5, 2]$ and its range is $[0, 10]$. Find the domain and range of:

a) $f(x+2) - 3$

b) $2f(3x)$

c) $|f(x-4) - 2|$

9) Recall the inter-quartile range is the difference between the third quartile and the first quartile.

At a small firm a survey of the customer service department found the length of time a caller was put on hold on one given day was the following:

4	5	5	6	7	4	8	7	6	5
5	6	7	6	6	5	8	9	9	10
7	8	11	5	4	6	5	12	13	6
3	7	8	8	9	9	10	9	8	9

a) Determine the mean, median and inter-quartile range of this data set. Good time to use Excel.

b) A new phone system is being considered. One company claims its system would reduce wait times by 3 minutes for each call. Determine the mean, median and inter-quartile if the new system is installed. Note how Excel reduces the work on this question.

c) A second company claims that their system will reduce wait time by 25%. Determine the mean, median and inter-quartile range under these conditions.

d) Based on your answers to parts *b* and *c*, what system would you recommend the firm purchase? Justify your answer.

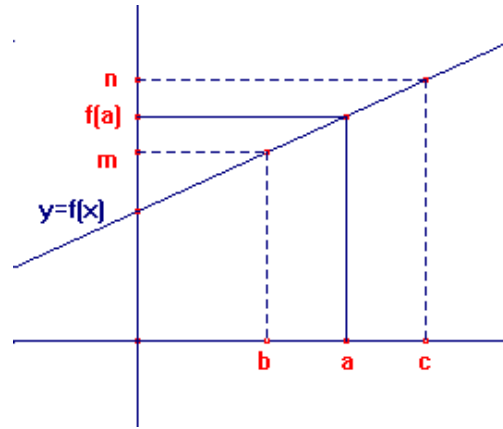
10) $y = f(x) = \frac{1}{2}x + 3$

(a) What is $f(6)$?

(b) Given x is within 2 units of 6

$$4 < x < 8$$

$$\text{Written: } |x - 6| < 2$$



Find the range of values for $f(x)$.

That is, within how far of $f(6)$ is y ? Write in the form: $|y - ?| < ?$

11) A person walked 3 blocks east, 5 blocks north, 4 blocks east and 4 blocks north to arrive at his destination.

- How many blocks did he walk?
- How far was he from his starting position? Give an exact answer.
- What angle (to four significant figures) does the line containing the starting position and the destination form with a horizontal line? NOTE: It is customary to consider the positive x -axis as 0° and then go counterclockwise when measuring the angles. Thus, the positive y -axis is 90° , the negative x -axis is 180° , and the negative y -axis is 270° .

12) NC Given: $g(x) = x^2 - 2x + 4$, substitute and simplify

$$\frac{g(x+h) - g(x)}{h}$$

13) NC Solve for x . Show all work!

a) $2^{x^2-x} = 8^2$

b) $x^{2/3} - 3x^{1/3} - 10 = 0$

c) $x + \frac{3x}{x-2} = \frac{6x-7}{x-2}$

d) $\frac{x!}{(x-2)!} = 210$