Name: _____

Date: _____

ENFD 116 - Section: _____

Test 1

1. Circles. For the following equation, what is the radius and center of the circle? (calculations are not required)

$$(x-3)^2+(y+2)^2=25$$

2. Domain. Determine the domain for each of the following functions (answer in interval notation):

a) $f(x)=\sqrt{x^2-5x+6}$

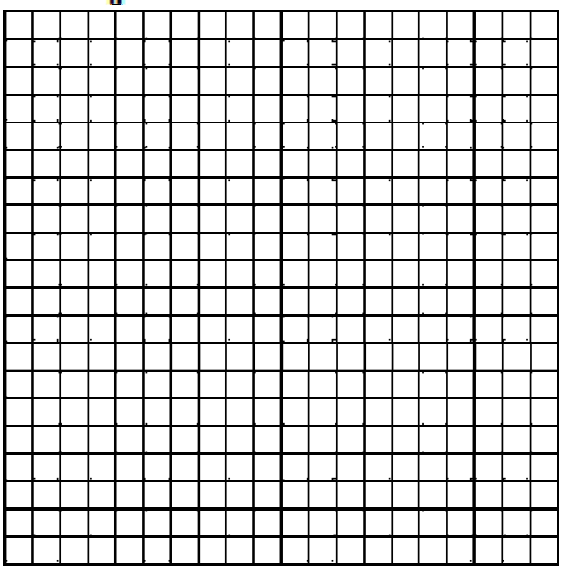
b) $3 \geq \dfrac{x+4}{x+5}$

3. Range. Determine the range for the following function (calculations are not required):

$$f(x)=\sqrt{x^2-5x+6}$$

4. Graphing. Graph the following function:

$$y=2-\frac{2}{3}x$$



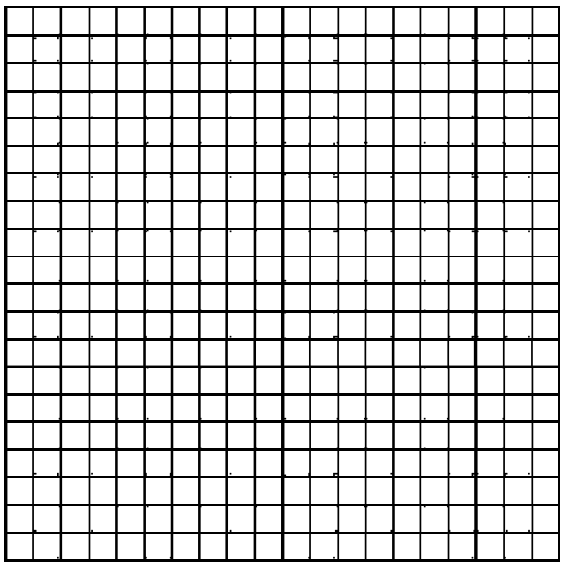
5. Linear Functions. Consider the two points (3,4) and (-5,-4)

a) What is the slope of the line that connects these two points?
b) What is the equation of the line that goes through these two points?
c) What is the distance between these two points?

6. Quadratic Functions. A small automotive pilot plant is analyzing its production rates, and finds that they should make a profit, $P(x)$, in thousands of dollars, for selling x cars per month, where:

$$P(x) = -x^2 + 6x - 4$$

a) How many cars should they produce to make the maximum profit?
b) What is the maximum profit?
c) Graph the $P(x)$:



7. Word problem. I have found that the best shape (considering handling and tipping properties) for a cylindrical beer can has a height, h , that is 1.5 (or $3/2$) times the radius, r , of the can (units in inches).

Helpful relations: $V_{cylinder} = \pi r^2 h$

a) Determine the volume of this can in terms of the radius of the can.
b) When designing this can, we didn't want the beer to be sitting out for a long time without anyone drinking it, and getting warm, so we decided to limit the volume to a maximum of 12π in^3; $og\ V \leq 12\pi$.
    a. For this design, what is the domain (answer in interval notation)?
    b. What is the range for the volume?