Algebra 2   Name:_____

Mr. Doherty   Date:_____

Algebra 2 – Study Guide

1)   Solve the following inequality or equation. Write a solution, and graph the
      solution set on a number line.

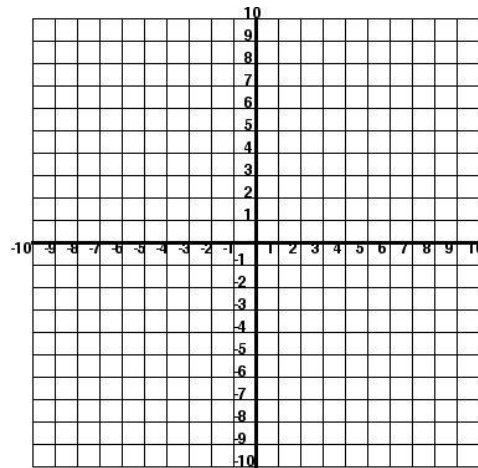a) $7 < 2x - 1 < 19$ b) $|3x - 3| = 12$

2)Calc If a certain car gets 23 miles per gallon, and has a gas tank that can hold 15
      gallons, how far can the car travel before it has to refill?

3)   Find the domain and range of the set of following points $\{(0,3),(2,1), (5,4), (6,9)\}$

4) Calc Graph the following set of equations on the axis below. Make sure to pay
      attention to shading and boundary lines.

$y - x > -5$

$y \leq 2x + 2$

5)   Find the equation in slope intercept form of the line that:

      a.   goes through the points (1,-2) and (3,4)

      b.   goes through (2,2) and is perpendicular to $y = \dfrac{1}{2}x$

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6)   Simplify the following expressions so there are no negative exponents and only
     one of each variable.

     a. $\left(\dfrac{k^2 \cdot s^3}{k^{-4} \cdot s}\right)^3$ b. $k^3 k^{-2} k^4$

7)   Simplify the following into standard form of a complex number.
     $$\dfrac{3+i}{2-i}$$

8)   Solve the system of equations using any method:
     $4m + n = 6$
     $5m + 3n = 4$

9)   Use the given matrices to perform the operations below. **<u>Make sure to circle
     your answer.</u>**

     $A = \begin{bmatrix} 3 & 2 \\ 4 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 & 4 \end{bmatrix}$ $C = \begin{bmatrix} -3 & 2 \\ 0 & 4 \\ 1 & -2 \end{bmatrix}$

     a) $3B$ b)   det[A]

     c) $B + A$ d) $B \cdot A$

     e) $B \cdot C$

10) Answer the following based on the function $f(x) = 2(x-1)^2 - 3$
     a. Does the parabola open up or down?   B. What is the vertex?

     c. What is the axis of symmetry?

11) Answer the following based on the function $h(x) = x^2 - 6x + 8$

    a. Will the parabola open up or down?   B. what is the vertex?

    c. What is the axis of symmetry?   D. What is the y-intercept?

    E. What are the x-intercepts?

12) Find all of the zeros of the polynomial $f(x) = x^3 - 13x - 12$, given that $(x - 4)$ is a factor of $f(x)$.

13) Divide the following polynomials and write the solution below.

$$\frac{x^3 - x^2 + 7}{x^2 + 2x - 1} = \underline{\hspace{4cm}}$$

14) Find the zeros of the function given below.

    a) $x^3 + x^2 - 16x - 16$

15) Simplify into standard form of a polynomial

    a) $(x - 2)(2x^2 - 3x - 3)$ b) $7m(m^4 + 2m - 6)$

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16)   Draw a graph that has a positive leading coefficient and an odd degree.
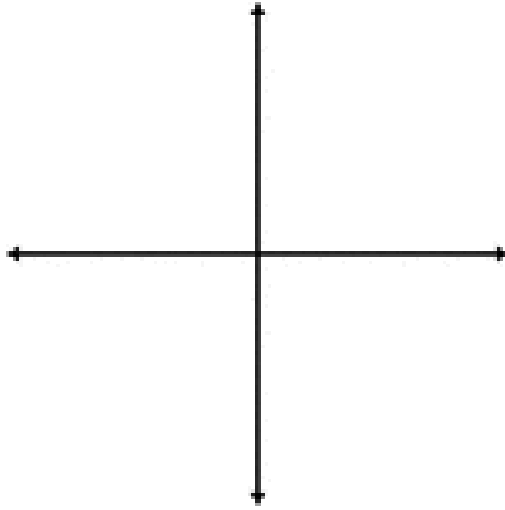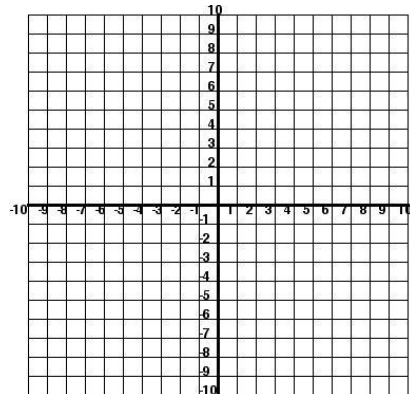
17)   Find the zeros of the following polynomials.
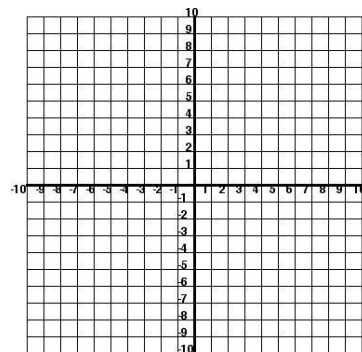
a. $y = x^2 + 4x + 13$ b. $y = (x+1)^2 - 4$

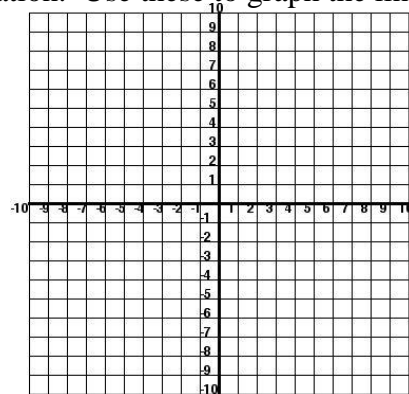18)   Graph the following function and state the domain and range.

$y = |x - 2| + 4$

19)   Make a scatter plot of 5 points that would have a negative correlation.

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20)   Solve the equation $4(3x - 1) = -3(2x + 8) - 4$

21)   Find the x and y intercepts of the following equation. Use these to graph the line.
        $6x + 12y = 24$

22) Calc Using your calculator, what is the best fitting linear regression line for the
        following points:
        (1, 7), (1, 6) (2,6) (3,5)   (4,4)   (5,5) (6,3) (7,2)

23)   Write the product in standard form
           $(3 + 2i)(1 - 5i)$