1.) Solve the following system by utilizing the graphing, substitution, and elimination methods. Show work for each. *[6 marks]*

ELIMINATION:

$4y = 1 - x$

$2x - 3y = -9$

SUBSTITUTION:

$4y = 1 - x$

$2x - 3y = -9$

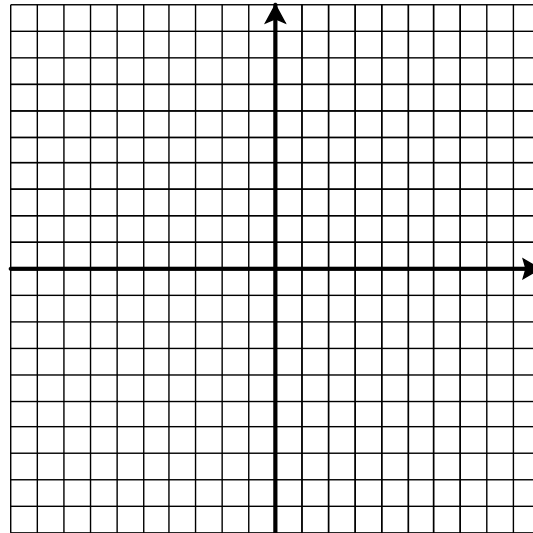**Answer: (,   )**

Answer: (,   )

GRAPHING

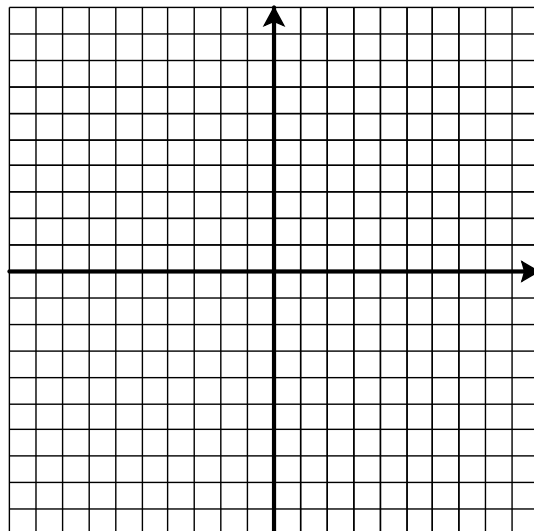$4y = 1 - x$

$2x - 3y = -9$

Answer: (,   )

2.) What is an ordered pair that provides a solution for this system of linear inequalities? Show lines and shading.
[3 marks]

$2x + 3y > 18$

$y + 6 \leq x$

3.) Gabrielle mixes an alloy containing 14% silver with an alloy containing 24% silver to make 100 kgs of an alloy with 18% silver. How many kgs of each kind of alloy did she use? *[3 marks]*

Equation 1: _____

Equation 2: _____

Answer:

4.) Rachel thinks it would be fun to perform the following transformations on the quadratic parent function: *[4 marks]* **(each part a-d builds from the previous part)**

a.) move it three units to the left   **new function:** _____

b.) vertically stretch it by a factor of 5   **new function:** _____

c.) translate it vertically by 4 units   **new function:** _____

d.) reflect it across the x-axis   **new function:** _____

5.) What is the vertex for the following functions? *[2 marks]*

a.) f(x) = 3(x − 3)² − 3   **Vertex: (,   )**

b.) f(x) = 2x² − 4x + 1   **Vertex: (,   )**

6.) Does the function, g(x) = 3x² − x − 4 have... (circle 1 answer for each part)
   [2 marks]

a.) 1 real zero   **2 real zeros**   **1 imaginary zero**   **2 imaginary zeros**

b.) MINIMUM   **MAXIMUM**

7.) What is the axis of symmetry for the function in #6? *[1 mark]*

A.o.S. _____

8.) Complete the square. *[2 marks]*

a.) $x^2 = 6x + 51$

Answer: _____

b.) Solve for the zeros from part a.) *[2 marks]*

x = _____ ; x = _____

9.) Solve for the zeros by utilizing the QUADRATIC FORMULA. *[3 marks]*

f(x) = 3x² − x + 12

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

10.) Thalia climbs to the top of the UT tower and throws a football straight down as part of a college admissions recruiting game. If Thalia throws the ball down at −11 m/s, and the UT tower is 100m tall, the equation is given as: *[2 marks]*

g(x) = −16x² − 11x + 100

How many seconds elapse before the football hits the ground.

Seconds prior to hitting the ground: _____

11.) Sam is building an art app on iOS and is trying to determine the right price point. He asks Dasha how she maximized the profit on her app, and she gives him the profit function she used when selling her best-selling app, "iGlee."
[2 marks]

$p(d) = 600 + 45d - 5d^2$

How much should Colton charge in order to maximize his profit?

$\$_____$

12.) Solve for the zeros utilizing the FACTORING method. *[6 marks]*

a.) $-7x^2 = 17x + 6$ **b.) $2x^2 + 3x = 27$**

X = _____ ; X = _____   **X = _____ ; X = _____**

13.) Solve for the zeros for the following quadratic functions. Utilize any method you prefer: *[6 marks]*

$f(x) = 2x^2 - 4x + 9$ $f(x) = -2x^2 - 4x + 9$

X = _____ ; X = _____   **X = _____ ; X = _____**

Answer key (marks will be awarded for correct responses preceded by calculations). In other words, only responses with work will receive credit.

1.) (–3, 1)

2.) there are infinite solutions within the solution region

3.) 60 kgs of 14%; 40 kgs of 24%

4-6.) tutorials

7.) x = 1/6

8.) x = ± 2√15 + 3

9.) x = $\dfrac{1 \pm \sqrt{-143}}{6}$

10.) use a calculator to solve for the zero

11.) use a calculator to determine the x-value at the maximum point on the graph

12.) x = 2, –3/7;   x = 3, 9/2

13.) x = $1 \pm \dfrac{i\sqrt{14}}{2}$;   x = –3.35, 1.35