HW 3 - 2: Answers

1. x = 6, y = 1
2. x = -2, y = -3, z = 2
3. x = 2, y = 5, z = -1
4. There will be 16 roses, 6 lilies, and 2 tulips in her basket.
5. He would spend $11 on the requested order.

Do the entire first page of today's notes with your partner

Change on tonight's HW. Replace #2 with HWK 3-5 #1

Solve the following systems.

1. $(5x + 2y = 32)(-3)$
$6x + 6y = 42$

$-15x - 6y = -96$
$6x + 6y = 42$

$-9x = -54$

$x = 6$

$5(6) + 2y = 32$

$2y = 2$

$y = 1$

$x = 6$
$y = 1$

2. $x - y = 1 \rightarrow x = y + 1$

$2y + z = -4$

$x - 2z = -6 \quad x = 2z - 6$

$\cdot 2$

$y + 1 = 2z - 6$

$y - 2z = -7$

$4y + 2z = -8$

$5y = -15$

$y = -3$

$-3 - 2z = -7$

$-2z = -4$

$z = 2$

$x + 3 = 1$

$x = -2$

$x = -2$

$y = -3$

$z = 2$

3. $\begin{cases} x + y + 3z = 4 \\ 2y + 3z = 7 \\ x - y - z = -2 \end{cases}$

$x + y + 3z = 4$
$x - y - z = -2$
$2x + 2z = 2$

$2x - 2y - 2z = -4$
$2y + 3z = 7$
$2x + z = 3$
$-2x - 2z = -2$
$-z = 1$
$z = -1$

$2y + 3(-1) = 7$
$2y = 10$
$y = 5$

$x - 5 + 1 = -2$

$x = 2$
$y = 5$
$z = -1$

4. A florist is making a bouquet of flowers. She has $58 to spend (including tax) and wants 24 flowers in the bouquet. Roses are $3 each, tulips cost $2 each, and lilies cost $1 each. She wants to have twice as many roses as the other two flowers combined the bouquet. How many of each flower type will be in her bouquet?

Let
x = # roses
y = # tulips
z = # lilies

$x + y + z = 24$
$3x + 2y + z = 58$
$x = 2(y + z) \rightarrow x - 2y - 2z = 0$

There will be 16 roses, 2 tulips & 6 lilies in her basket

$3x + 2y + z = 58$
$x - 2y - 2z = 0$
$4x - z = 58$

$-2x - 2y - 2z = -48$
$3x + 2y + z = 58$
$x - z = 10$

$4x - z = 58$
$-x + z = -10$
$3x = 48$
$x = 16$
$z = 6$
$y = 2$

5. Gramps loves his sweets! He has been to the candy shop 3 times this month! On his first visit he bought 1 pound of jelly beans and 2 pounds of chocolates for $7. On his second visit they were out of chocolates so he bought 1 pound of jelly beans and 2 pounds of caramels for $5. On his third visit, they had replenished the chocolates so he went all out and bought 1 pound of jelly beans, 3 pounds of chocolates and 2 pounds of caramels all for $14. How much would he spent on two pounds of jelly beans, 1 pound of chocolates and 3 pounds of caramels?

Let
x = cost jelly beans / pound
y = cost chocolates / pound
z = cost caramels / pound

$x + 2y = 7$
$x + 2z = 5$
$x + 3y + 2z = 14$

$-x - 2z = -5$
$x + 3y + 2z = 14$

$3y = 9$
$y = 3$

$x + 2(3) = 7$
$x = 1$

$1 + 2z = 5$
$2z = 4$
$z = 2$

$2(1) + 3 + 3(2) = 11$

He would spend $11 on the requested order

U3D3

Solving Systems Graphically

Warm-Up:

Graph: $x + y = 6$ $\Rightarrow$ $y = -x + 6$ ($y = mx + b$)

$m = -1 = \frac{-1}{1}$

$b = 6$

or list of points

$\{(1, 5)\}$

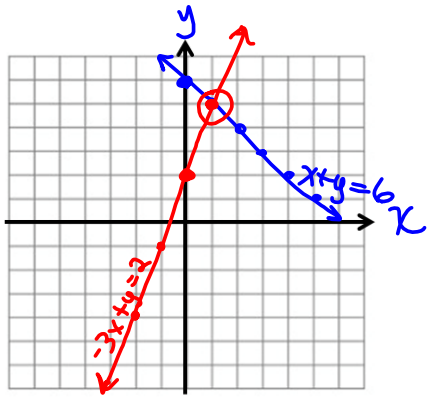
$-3x + y = 2$

$y = 3x + 2$

$m = \frac{3}{1}$

$b = 2$

or list points



Solve the above system algebraically.

$① (-1) \Rightarrow -x - y = -6$

$② \quad -3x + y = 2$

$-4x = -4$

$x = 1$

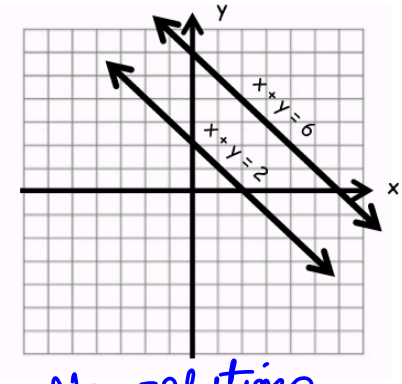
$1 + y = 6$

$y = 5$

$\{(1, 5)\}$

For the next two examples, $x + y = 6$ and a second equation have been graphed for you. Determine the solution for each system.

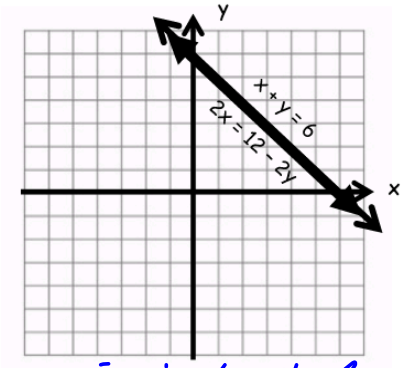
a.



No solutions

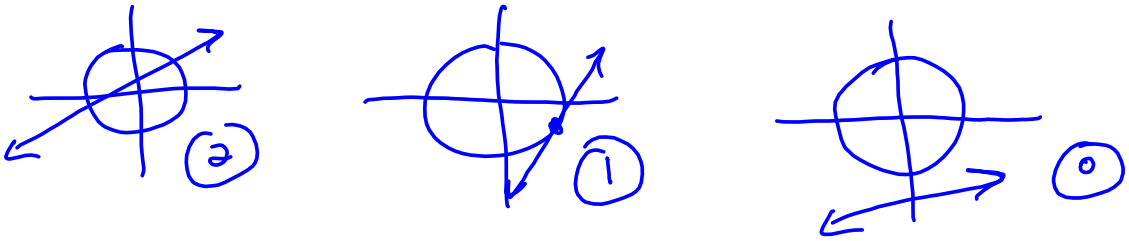
$\{\}$ or $\emptyset$

b.

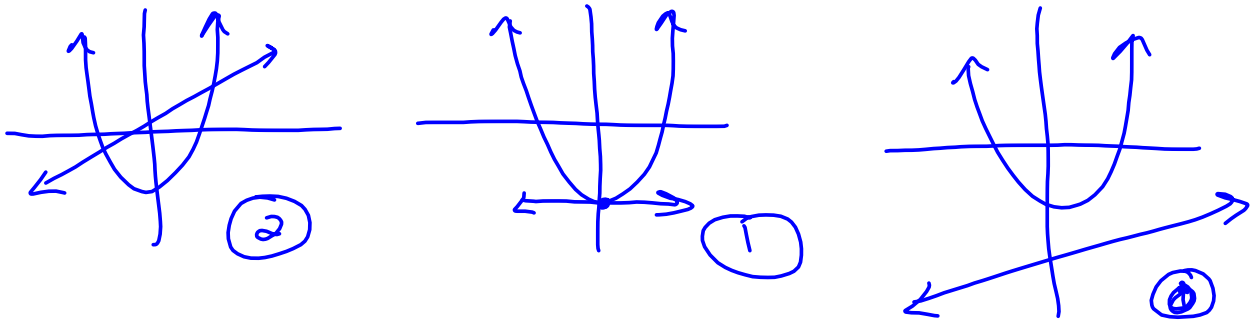


An infinite # of solutions

If you were to graph a circle and a line on the same set of axes, how many solutions are possible? Sketch each possibility.



How about a parabola and a line? Again, sketch each possibility.



The standard form of an equation for a circle is: $(x - h)^2 + (y - k)^2 = r^2$

Where the center is: (h, k) And the radius is: $r = \sqrt{r^2}$

* opposite of the equation

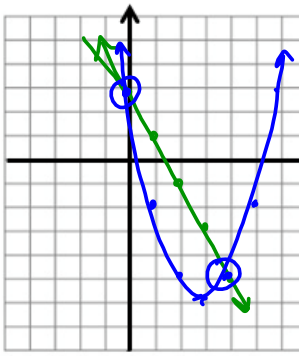
Graph the following circles:

Do question 1 from Day 5

1. $y_1 = -2x + 3$

   $y_2 = x^2 - 6x + 3$

X	y_1	y_2
0	3	3
1	1	-2
2	-1	-5
3	-3	-6
4	-5	-5

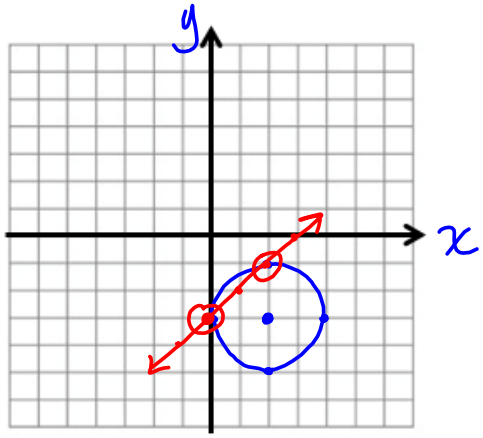


{(0,3),(4,-5)}

2. $(x - 2)^2 + (y + 3)^2 = 4$

center = (2, -3)

Radius = $\sqrt{4} = 2$



On the same set of axis (above) graph:

1. ~~$4x + 3y = 0$~~

Where do they intersect?

2. $x - y = 3$

$-y = -x + 3$

$y = x - 3$

$m = \frac{1}{1}$ $b = -3$

{(0,-3),(2,-1)}

Review Completing the Square. Set up. Do not solve.

$x^2 + 4x = 6$

$\left(\frac{b}{2}\right)^2 = \left(\frac{4}{2}\right)^2 = 4$

$x^2+4x+\boxed{4} = 6+\boxed{4}$

$(x+2)(x+2) = 10$

$(x+2)^2 = 10$

Rewrite the equation of the circle by completing the square in both x and y. Describe and graph the circle represented by the equation.

3. $x^2 + y^2 - 4x + 2y + 1 = 0$

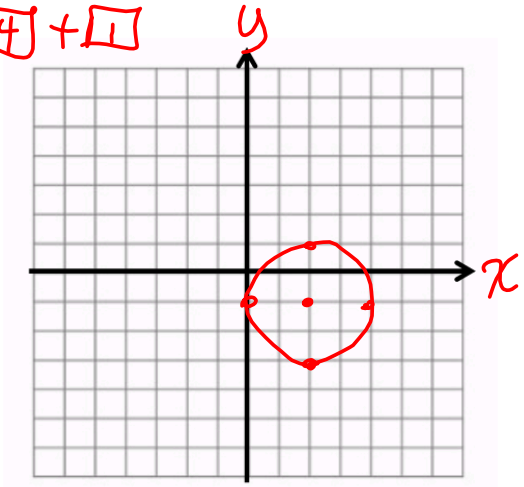
$x^2 - 4x + \boxed{4} + y^2 + 2y + \boxed{1} = -1 + \boxed{4} + \boxed{1}$

$\left(\frac{-4}{2}\right)^2$ $\left(\frac{2}{2}\right)^2$

$(x-2)^2 + (y+1)^2 = 4$

center: $(2, -1)$

Radius $= \sqrt{4} = 2$



4. $x^2 + y^2 - 6x + 4y - 3 = 0$

$x^2 - 6x + \boxed{9} + y^2 + 4y + \boxed{4} = 3 + \boxed{9} + \boxed{4}$

$(x-3)^2 + (y+2)^2 = 16$

center $= (3, -2)$

$R = \sqrt{16} = 4$