HW #8 12, 14, 32, 36, 54, 60, 66, 92, 94, 106

12) pts are $(-2,-3)$ and $(4,-1)$

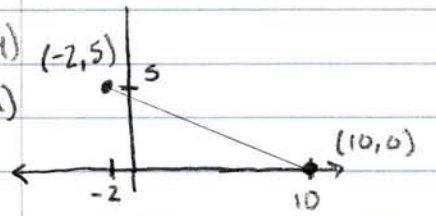
a) $d = \sqrt{(-2-4)^2+(-3-(-1))^2} = \sqrt{(-6)^2+(-2)^2}$

$= \sqrt{36+4} = \sqrt{40}$

$\boxed{= 2\sqrt{10}}$

b) Midpt: $\left(\frac{-2+4}{2}, \frac{-3+(-1)}{2}\right) \boxed{= (1,-2)}$

14) a)



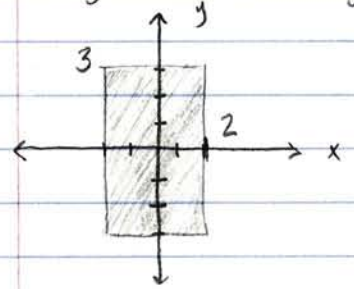
b) $d = \sqrt{(-2-10)^2+(5-0)^2} = \sqrt{(-12)^2+(5)^2}$

$= \sqrt{169}$

$\boxed{= 13}$

c) Midpt: $\left(\frac{-2+10}{2}, \frac{5+0}{2}\right) \boxed{= \left(4, \frac{5}{2}\right)}$

32) $\{(x,y) \mid |x| \le 2 \text{ and } |y| \le 3\}$



36) a) d from $(7,3)$ to origin is $\sqrt{(7-0)^2+(3-0)^2} = \sqrt{7^2+3^2} = \sqrt{58}$

d from $(3,7)$ to origin is $\sqrt{(3-0)^2+(7-0)^2} = \sqrt{3^2+7^2} = \sqrt{58}$ } equal

b) d from (a,b) to origin is $\sqrt{(a-0)^2+(b-0)^2} = \sqrt{a^2+b^2}$

d from (b,a) to origin is $\sqrt{(b-0)^2+(a-0)^2} = \sqrt{a^2+b^2}$ } equal

54) $\frac{x^2}{9} + \frac{y^2}{4} = 1$

x intercept: $y=0$ $\quad \frac{x^2}{9} + 0 = 1$

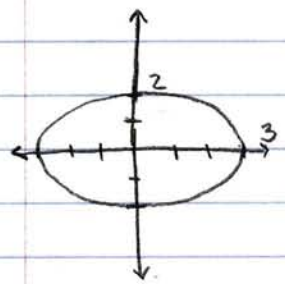
$x^2 = 9$

$\boxed{x = \pm 3 \Rightarrow (\pm 3, 0)}$

y intercept: $x=0$ $\quad 0 + \frac{y^2}{4} = 1$

$y^2 = 4$

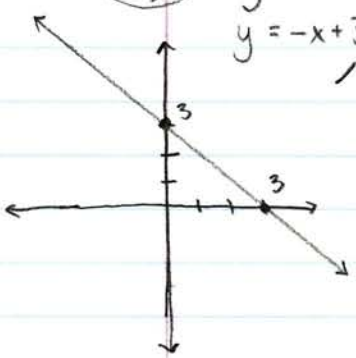
$\boxed{y = \pm 2 \Rightarrow (0, \pm 2)}$



60, 66, 92, 94, 106

60) $x + y = 3$

$y = -x + 3$ ✓



x	-2	-1	0	1	2	3	4
y	5	4	3	2	1	0	-1

✓

y intercept: $x = 0 \quad y = 0 + 3 \quad y = 3$

x intercept: $y = 0 \quad 0 = -x + 3 \quad x = 3$ ✓

x-axis symmetry: $x + (-y) = 3$

$-x + y = -3 \neq x + y = 3$ not symmetric w/ x axis

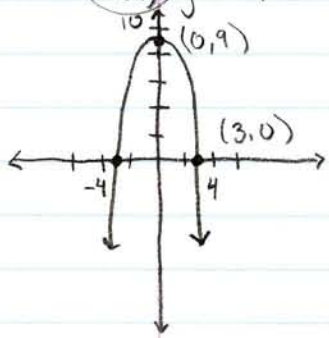
y-axis symmetry: $(-x) + y = 3$

$x - y = -3 \neq x + y = 3$ not symmetric w/ y-axis

Origin symmetry: $(-x) + (-y) = 3$

$x + y = -3 \neq x + y = 3$ not symmetric w/ origin

66) $y = 9 - x^2$



x	-4	-3	-2	-1	0	1	2	3	4
y	-7	0	5	8	9	8	5	0	-7

y intercept: $x = 0 \quad y = 9 - 0 \quad y = 9$

x intercept: $y = 0 \quad 0 = 9 - x^2$

$x^2 = 9 \quad x = \pm 3$

x-axis symmetry: $(-y) = 9 - x^2$

$y = x^2 - 9 \neq 9 - x^2$ not x-axis symmetry.

y-axis symmetry: $y = 9 - (-x)^2$

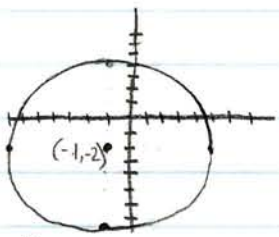
$y = 9 - x^2 \overset{\checkmark}{=} 9 - x$ has y-axis symmetry.

origin symmetry: $(-y) = 9 - (-x)^2$

$y = x^2 - 9 \neq 9 - x^2$ not symmetric w/ origin

92) $(x+1)^2 + (y+2)^2 = 36$ Find center and sketch

center is at $(-1, -2)$ with radius 6



94) Center $(-1, -4)$ radius 8

$h = -1, k = -4, r = 8$ we get $(x-(-1))^2 + (y-(-4))^2 = 8^2$

$(x+1)^2 + (y+4)^2 = 64$

106) $x^2 + y^2 + \frac{1}{2}x + 2y + \frac{1}{16} = 0 \overset{\text{completing the square}}{\Rightarrow} \left(x^2 + \frac{1}{2}x + \left(\frac{\frac{1}{2}}{2}\right)^2\right) + \left(y^2 + 2y + \left(\frac{2}{2}\right)^2\right) = -\frac{1}{16} + \left(\frac{\frac{1}{2}}{2}\right)^2 + \left(\frac{2}{2}\right)^2$

$\Rightarrow (x + \frac{1}{4})^2 + (y+1)^2 = 1$

So, Circle has center at $(-\frac{1}{4}, -1)$ and radius of 1