

Circles

① $x^2 + y^2 + 4x - 6y + 12 = 6$

$$\boxed{x^2 + 4x + 4} + \boxed{y^2 - 6y + 9} = -12 + 4 + 9$$

$$(x+2)^2 + (y-3)^2 = 1$$

$$\boxed{\text{ctr } (-2, 3) ; \text{ radius} = \sqrt{1} = 1}$$

x-int \rightarrow plug zero in for y + solve

$$(x+2)^2 + (0-3)^2 = 1$$

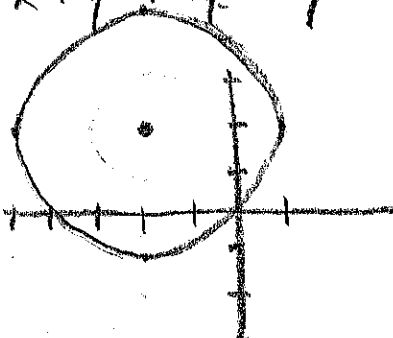
$$(x+2)^2 + 9 = 1 \rightarrow (x+2)^2 = -8 \rightarrow \text{NONE b/c you can't take square root of } -8.$$

y-int \rightarrow plug zero in for x + solve

$$(0+2)^2 + (y-3)^2 = 1$$

$$4 + (y-3)^2 = 1 \rightarrow (y-3)^2 = -3 \rightarrow \text{NONE b/c you can't take square root of } -3$$

② $x^2 + y^2 + 4x - 4y - 1 = 0 \rightarrow \boxed{x^2 + 4x + 4} + \boxed{y^2 - 4y + 4} = 1 + 4 + 1$



$$(x+2)^2 + (y-2)^2 = 9$$

$$\text{ctr } (-2, 2) ; \text{ radius} = \sqrt{9} = 3$$

③ * For those in 4th per pre-calc, use the graph below to find the standard form of the equation of the circle



$$(h, k) = (3, 1) ; r = 2$$

$$\boxed{(x-3)^2 + (y-1)^2 = 4}$$

