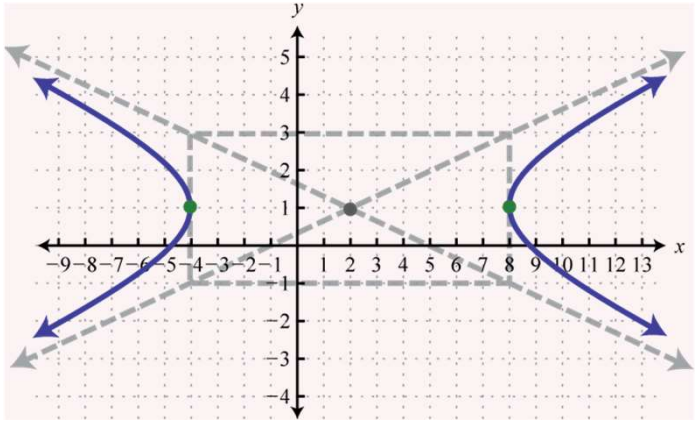
Ch. 11 Conics

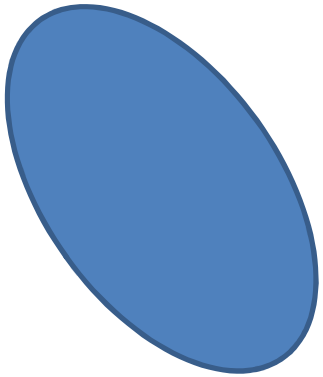


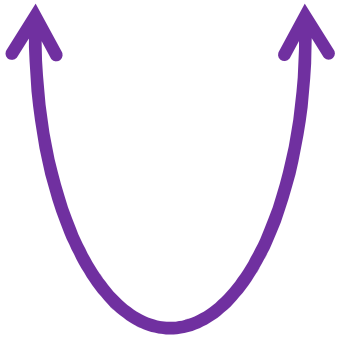
Circle

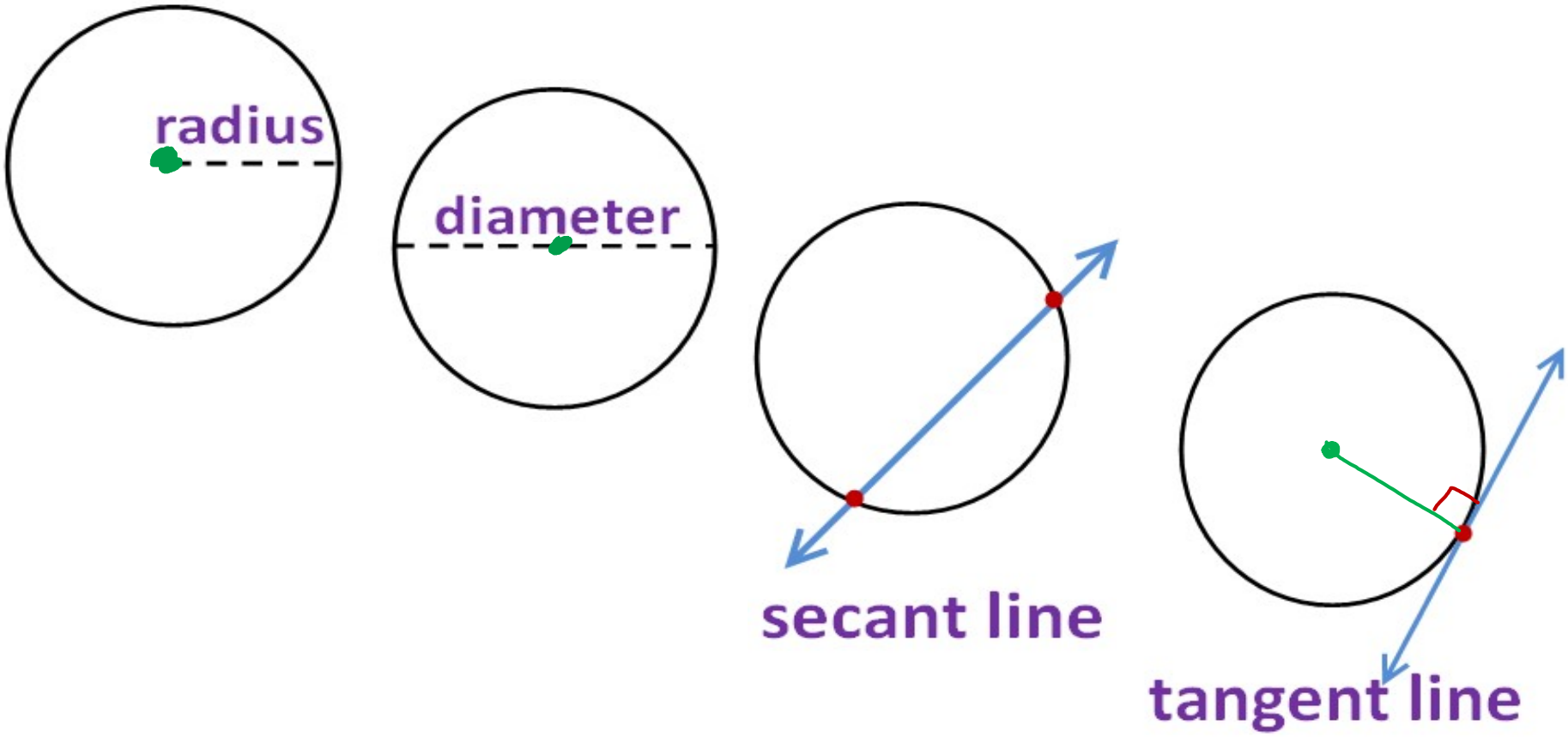
Ellipse

Hyperbola

Parabola






radius
diameter
secant line
tangent line

Standard Form of the equation of a circle:

$$(x-h)^2 + (y-k)^2 = r^2$$

(h,k) = center r = radius

General Form of the equation of a circle: *(D,E,F are constants)*

$$x^2 + y^2 + Dx + Ey + F = 0$$

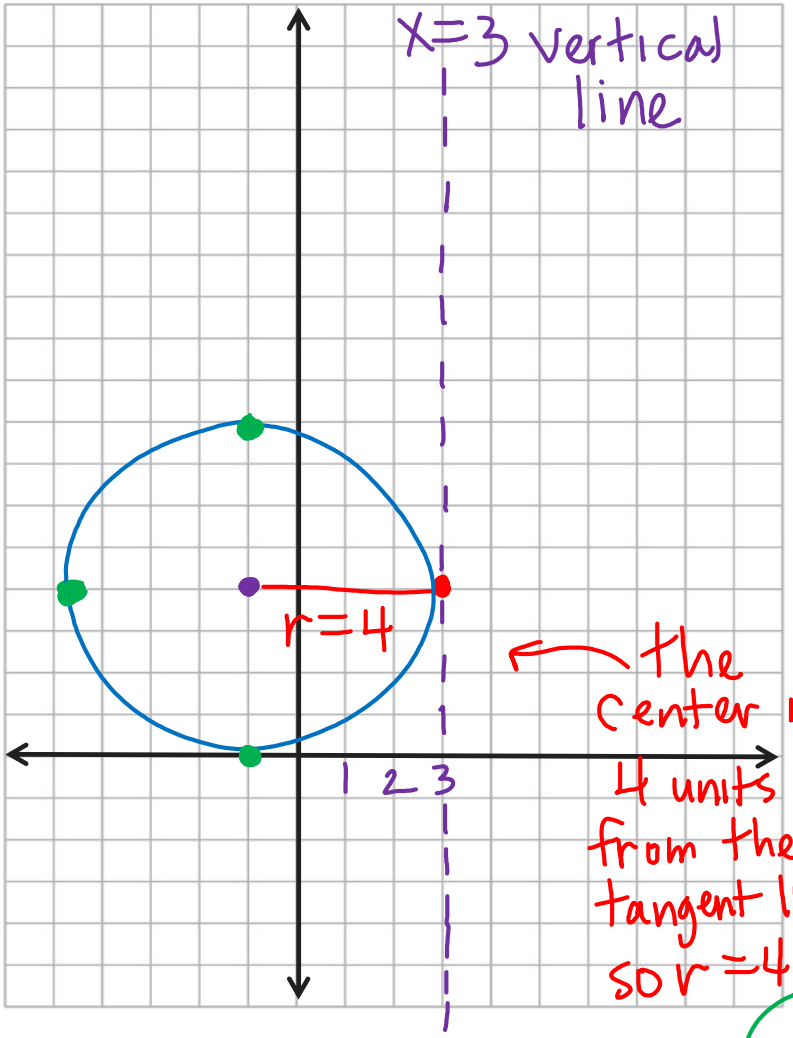
<u>IMPORTANT</u>: use fractions (not decimals) when completing the square.

Example: Complete the square for the given set of values.

$$x^2 + 7x + \frac{49}{4} = \left(x + \frac{7}{2}\right)^2$$

Divide coefficient by 2, then square it

#1 Write the equation in standard form and sketch graph.



h k

Given: center (-1, 4)
circle is tangent to x = 3

1st graph given information

2nd equation.

$$(x+1)^2 + (y-4)^2 = 16$$

h k r^2

opposite of given values

*hint for later on.

x=3 vertical
y=3 horizontal

#2 Write the equation in standard form and sketch graph.

$$x^2 + y^2 - 4x + 14y - 47 = 0$$

+47 +47

regroup:

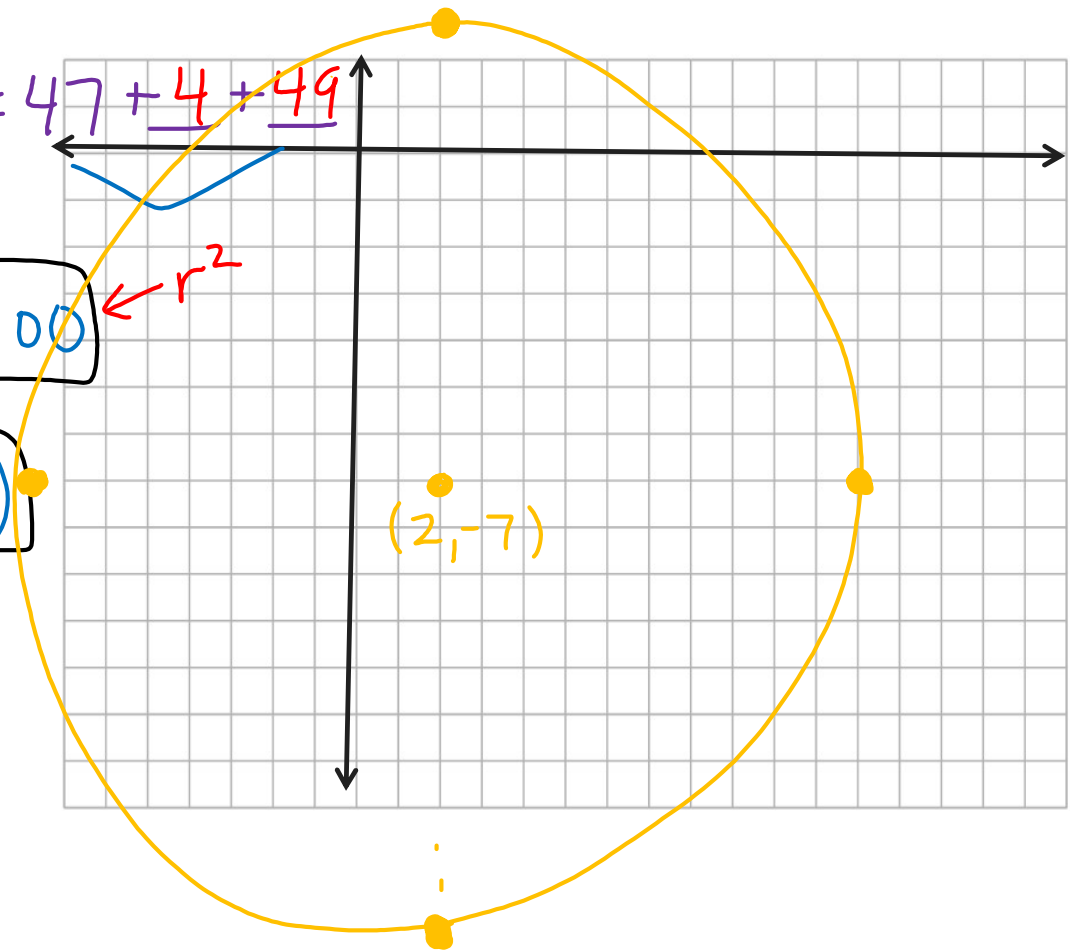
$x^2 - 4x + \underline{4} + y^2 + 14y + \underline{49} = 47 + \underline{4} + \underline{49}$

$(x-2)^2 + (y+7)^2 = 100$ ← r^2

Center = $(2, -7)$

$r = \sqrt{100}$

$r = 10$



#3 Write the equation in standard form and sketch graph.

Coefficients must = 1

$$\frac{2x^2 + 2y^2 - 20x + 8y + 34}{2} = \frac{0}{2}$$

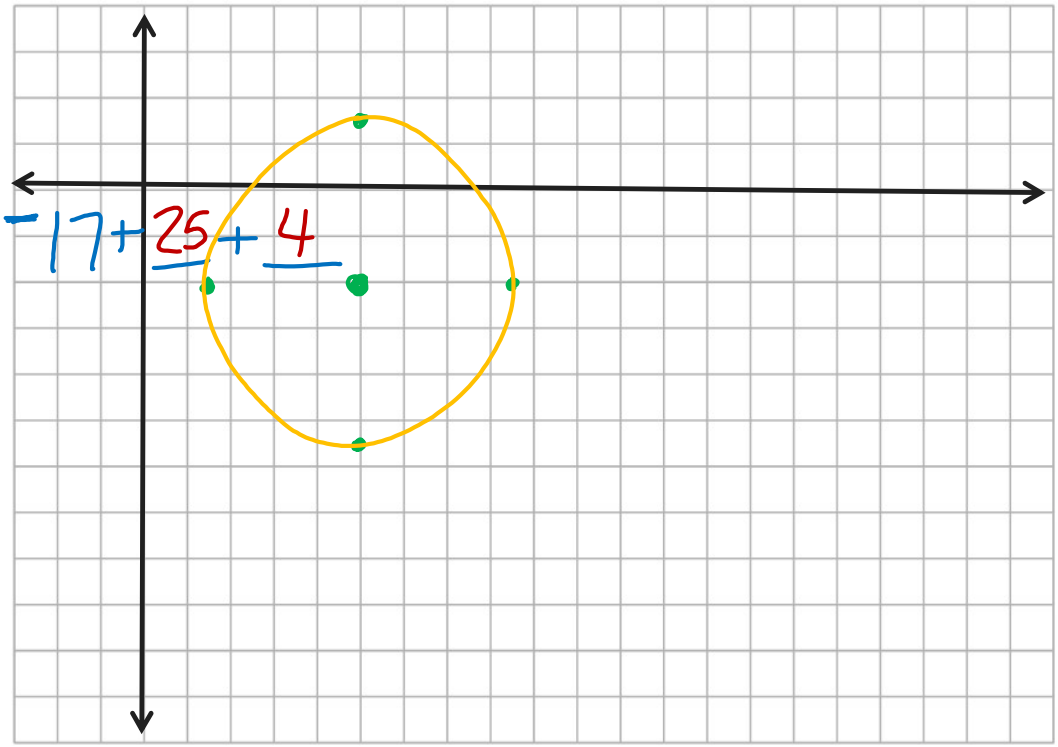
$x^2 + y^2 - 10x + 4y + 17 = 0$

$x^2 - 10x + \underline{25} + y^2 + 4y + \underline{4} = -17 + \underline{25} + \underline{4}$

$(x-5)^2 + (y+2)^2 = 12$

center $(5, -2)$

$r = \sqrt{12} \approx 3.5$ for graphing purposes



#11 **DO NOT** use decimals when solving for the equation of the circle. Use fractions and clearly show all steps.

$$x^2 + y^2 + y = \frac{3}{4}$$

#13 **DO NOT** use decimals when solving for the equation of the circle. Use fractions and clearly show all steps.

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