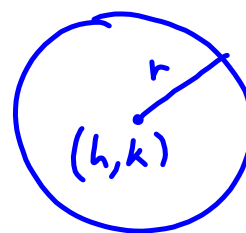


13.2 p. 825

Center - radius form
of a circle

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

Center: (h,k) radius = $\sqrt{r^2} = r$ 

ex like # 1

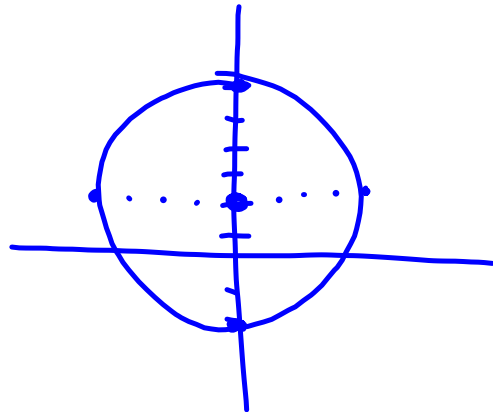
$$x^2 + (y-2)^2 = 16$$

$(x-0)^2$ (green arrow pointing to x^2)
 r^2 (green arrow pointing to 16)

$$\text{Center} = (0, 2)$$

$$\text{radius} = \sqrt{16} = 4$$

Sketch of the graph:



ex 3 $(\overset{h}{5}, \overset{k}{-2}) \quad r = 4$

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

$$(x-5)^2 + (y-(-2))^2 = 4^2$$

$$(x-5)^2 + (y+2)^2 = 16 \quad \leftarrow$$

$$\underline{ax10} \quad ((-12, 13) \quad r^2 = \sqrt{7^2} \rightarrow r^2 = 7$$
$$(x + 12)^2 + (y - 13)^2 = 7$$

ex 12 $x^2 + y^2 - 8x - 12y + 3 = 0$

$$x^2 - 8x + \frac{16}{\downarrow \frac{1}{2} \rightarrow \square} + y^2 - 12y + \frac{36}{\downarrow \frac{1}{2} \rightarrow \square} = -3 + 16 + 36$$
$$(x-4)^2 + (y-6)^2 = 49$$

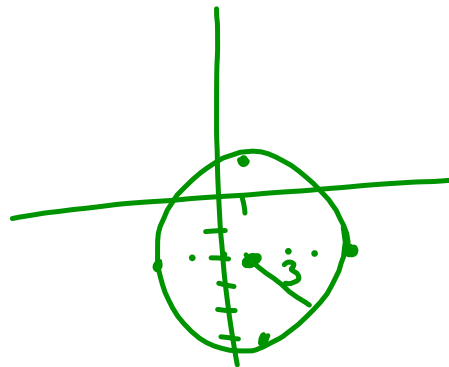
$$C(4,6) \quad r = \sqrt{49} = 7$$

$$\underline{Q.14} \quad x^2 + y^2 - 2x + 4y - 4 = 0$$

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

$$(x-1)^2 + (y+2)^2 = 9$$

$$C(1, -2) \quad r=3$$



2x16

$$2x^2 + 2y^2 + 20x + 16y + 10 = 0 \quad \left(\begin{array}{l} \div 2 \\ \div y \end{array} \right)$$

$$x^2 + 10x + \frac{25}{2} + y^2 + 8y + \frac{16}{2} = -5 + \frac{25}{2} + \frac{16}{2}$$

$$(x+5)^2 + (y+4)^2 = 36$$

$$C(-5, -4) \quad r=6$$

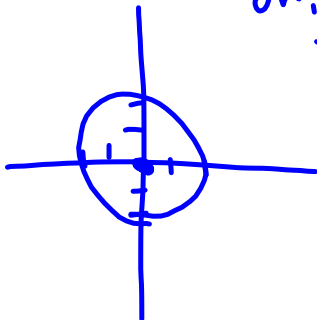
ex 18

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

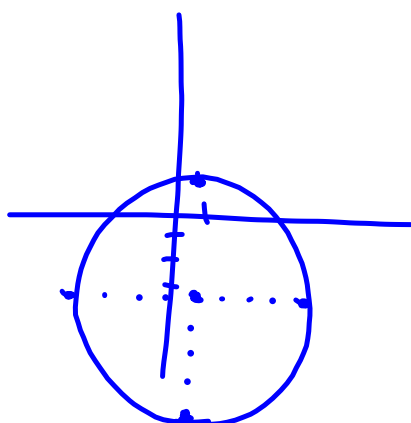
$$(x+0)^2 + (y+0)^2 = 4$$

$$C(0,0) \quad r=2$$

origin



ex 22 $(x-1)^2 + (y+3)^2 = 16$
C (1, -3) r = 4

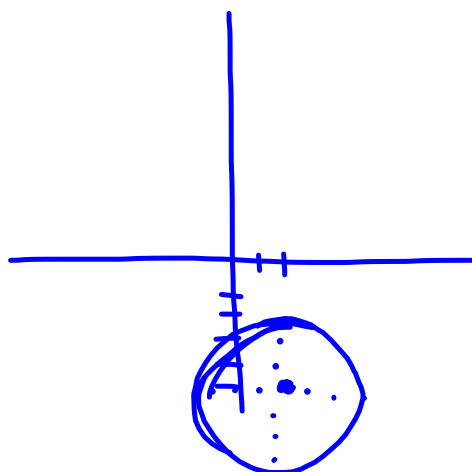


$$\underline{\text{ex 26}} \quad x^2 + y^2 - 4x + 10y + 20 = 0$$

$$x^2 - 4x \underline{+4} + y^2 + 10y \underline{+25} = -20 \underline{+4} \underline{+25}$$

$$(x - 2)^2 + (y + 5)^2 = 9$$

$$C(2, -5) \quad r = 3$$



Back to parabolas... 11.6 & 11.7

$$y = a(x-h)^2 + k \longleftrightarrow y = ax^2 + bx + c$$

$$V(h, k)$$

$$x = \frac{-b}{2a}$$

$$V\left(\downarrow, _ \right)$$

p. 716
ex 12

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

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

$$y = 3(x^2 - 4x + 4) + 1$$

$$y = 3x^2 - 12x + 12 + 1$$

$$y = 3x^2 - 12x + 13 \text{ then use } x = \frac{-B}{2A}$$

ex 24 p. 727

$$y = x^2 + 10x + 23$$

$$y = x^2 + 10x + \frac{25}{1} + \underbrace{23 - 25}_{-2}$$

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

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

$$V(-5, -2)$$

ex 10 p. 726

$$y = |x^2 - x + 5$$

$$y = x^2 - x + \frac{1}{4} + 5 - \frac{1}{4}$$

$$y = \left(x - \frac{1}{2}\right)^2 + \frac{19}{4}$$

$$V\left(\frac{1}{2}, \frac{19}{4}\right)$$

$+\frac{1}{4} - \frac{1}{4} = 0$ so the
problem
hasn't changed

$$\left[\begin{array}{r} 5 - \frac{1}{4} \\ 5 - \frac{1}{4} \\ \frac{20}{4} - \frac{1}{4} \end{array} \right]$$

ex 26 p. 727

$$y = -3x^2 + 12x - 8$$

$$y = -3x^2 + 12x - 8$$

$$y = -3(x^2 - 4x + 4) - 8 + 12$$

so add +12 here

$$y = -3(x - 2)^2 + 4 - 12$$

I added

$$V(2, 4)$$