THEORETICAL PART: *Solutions*

Definition:

The **standard form** of the equation for a circle of radius r and center (a, b) is

$$(x - a)^2 + (y - b)^2 = r^2.$$

PRACTICAL PART:

1. Find the standard form of the equation for the circle with radius 3 and center $(-2, 7)$.

$$(a, b) = (-2, 7)$$
$$r = 3$$

$$\boxed{(x+2)^2 + (y-7)^2 = 9}$$

$$(x - (-2))^2 + (y-7)^2 = 3^2$$

2. Find the standard form of the equation for the circle with a diameter whose endpoints are $(-4, -1)$ and $(2, 5)$.
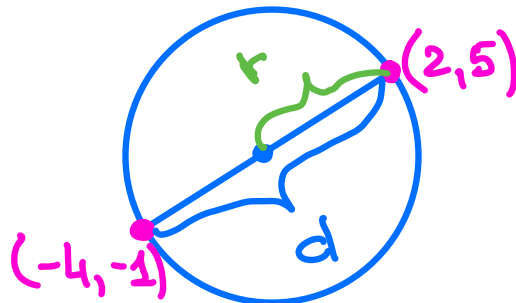
midpoint: $M\left(\dfrac{-4+2}{2}, \dfrac{-1+5}{2}\right)$

$M(-1, 2)$

center: $(-1, 2)$

$r = \sqrt{(2+1)^2 + (5-2)^2} = \sqrt{18}$

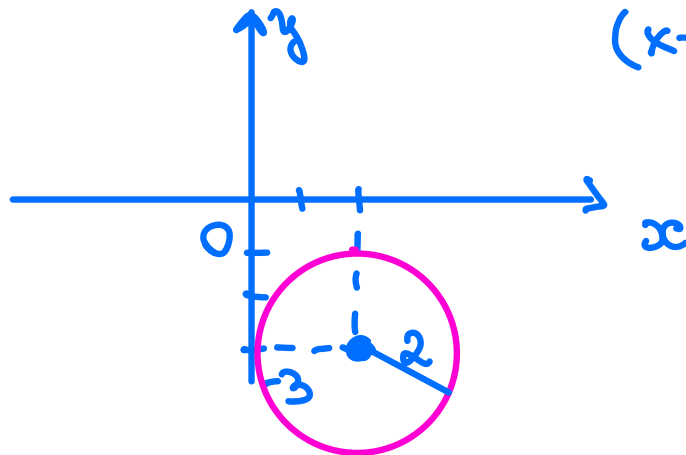3. Sketch the graph of the circle defined by $(x - 2)^2 + (y + 3)^2 = 4$.

$$(x+1)^2 + (y-2)^2 = r^2 = 18$$

$$\boxed{(x+1)^2 + (y-2)^2 = 18}$$

4. Sketch the graph of the equation $x^2 + y^2 + 8x - 2y = -1$.

3.

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

Center: $(2, -3)$

radius: $r = 2$

4.

$$x^2 + y^2 + 8x - 2y = -1$$

$$(x^2 + 8x) + (y^2 - 2y) = -1$$

$$(x^2 + 8x + 16) + (y^2 - 2y + 1) - 16 - 1 = -1$$

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