The standard form of the equation of a circle with radius r and center at (h, k) is

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

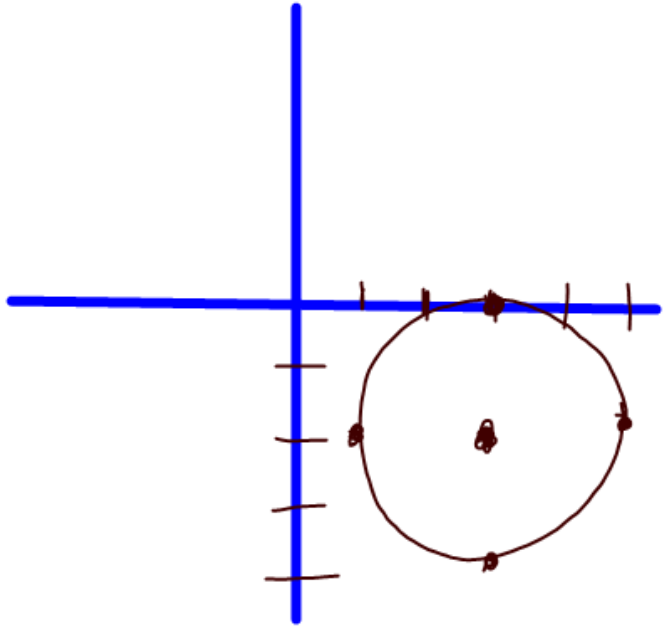
ex.1

Write the standard form of the equation of the circle that is tangent to the *x*-axis and has its center at (3, −2). Then graph the equation.

(h, k)

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

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



The general form of the equation of a circle is

$$1x^2 + 1y^2 + Dx + Ey + F = 0,$$

where D, E, and F are constants.

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

The equation of a circle is $2x^2 + 2y^2 - 4x + 12y - 18 = 0$.

$\frac{2}{2}$

$x^2 + y^2 - 2x + 6y - 9 = 0$

$+9 \quad +9$

$\left(\frac{-2}{2}\right)^2$ $x^2 - 2x + 1 + y^2 + 6y + 9 = 9 + 1 + 9$

$(-1)^2$

$\left(\frac{6}{2}\right)^2 = 9$

$(3)^2 =$

perfect square

$(x-1)^2 + (y+3)^2 = 19$

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

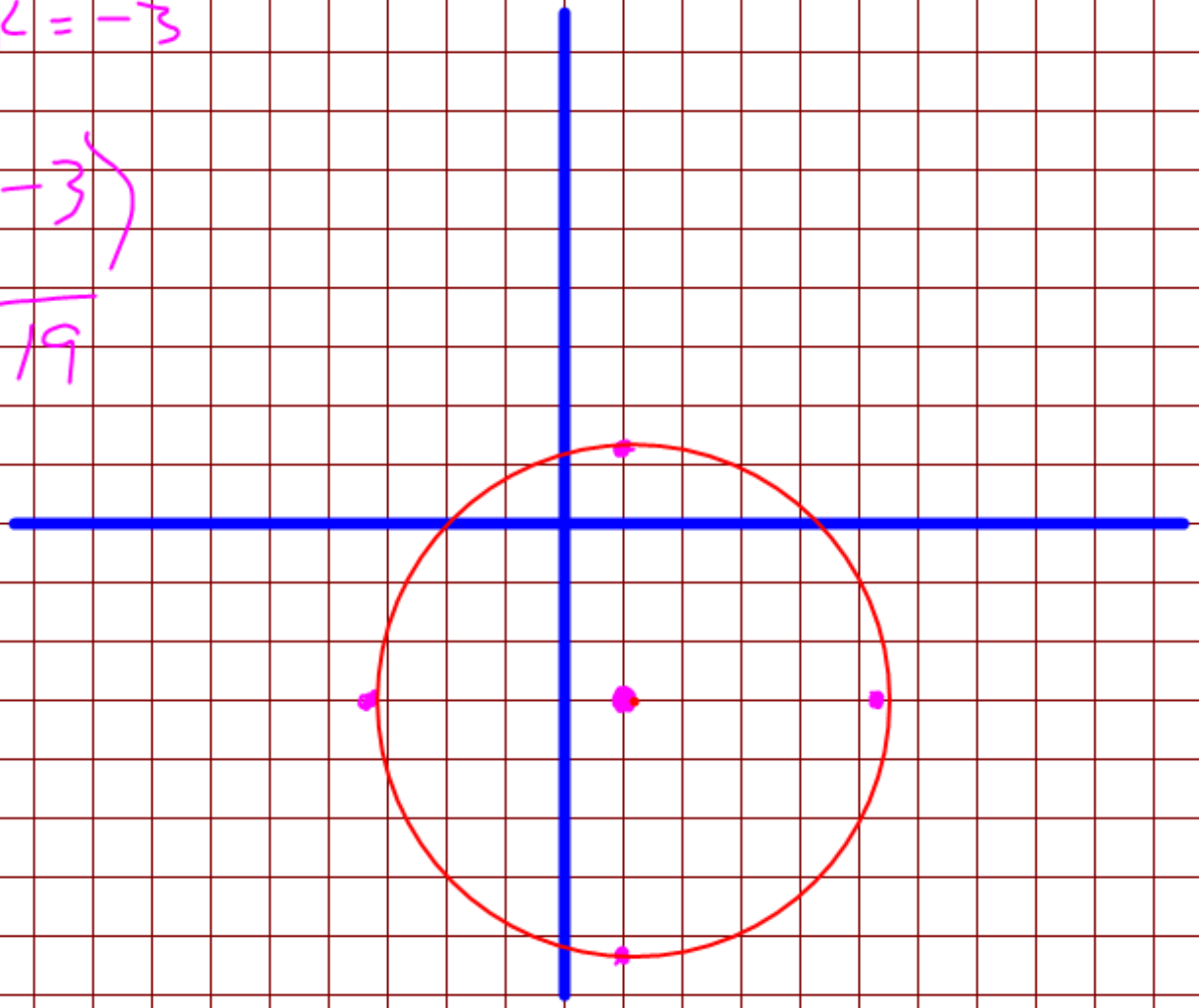
$(x-1)^2 + (y+3)^2 = 19$

$19 = r^2$

$h = 1$ $\quad k = -3$

center $(1, -3)$

radius $= \sqrt{19}$



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