Precalc 10.2

Determine and use standard form for the equation of a circle*
Determine and use general form for the equation of a circle*
Graph circles*

circle
chord
radius

center

concentric

conic section slice of cone

ellipse

parabola

hyperbola

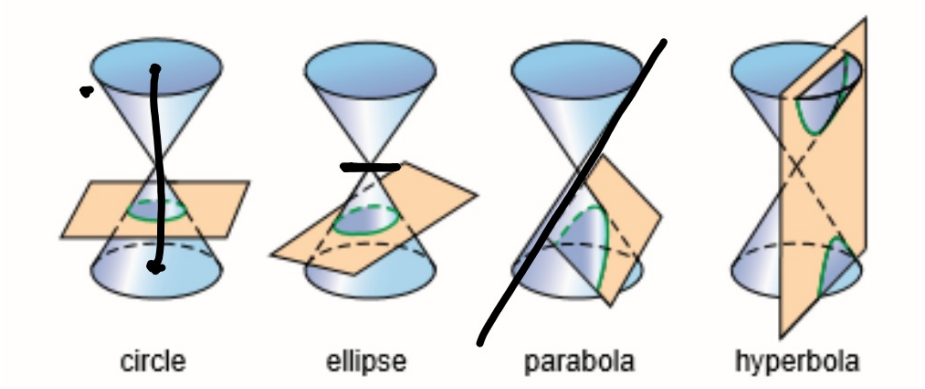
degenerate conic

completing the square

*Alg 2 Ch. 10
(also Geometry)

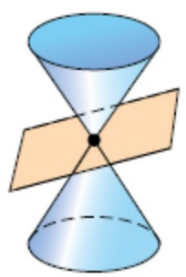
1

conic models
activity: sidewalk chalk
whiteboards

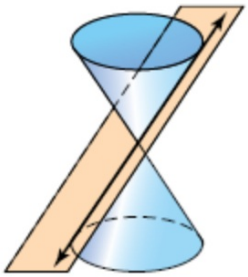


oval

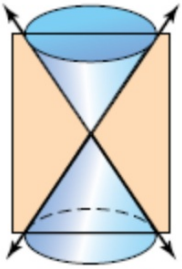
When the plane does pass through the vertex of a conical surface, as illustrated below, the resulting figure is called a **degenerate conic.** A degenerate conic may be a point, line, or two intersecting lines.



point
(degenerate ellipse)



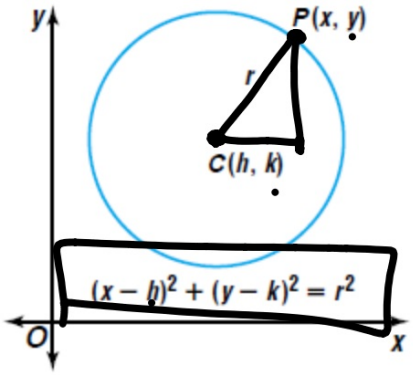
line
(degenerate parabola)



intersecting lines
(degenerate hyperbola)

Meh…

Sidewalk chalk



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

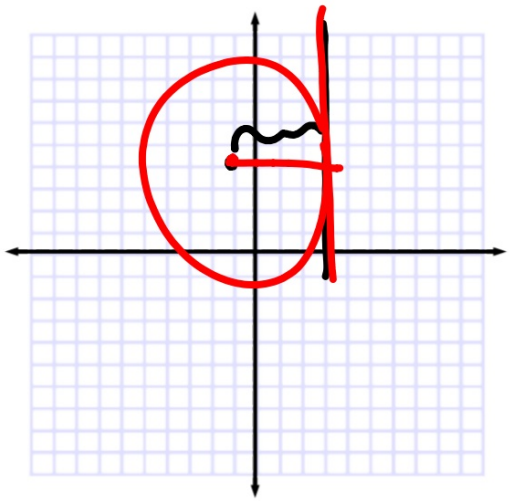
Standard Form of the Equation of a Circle	The standard form of the equation of a circle with radius r and center at (h, k) is $$(x - h)^2 + (y - k)^2 = r^2.$$

Write the standard form of the equation of each circle described. Then graph the equation.

6. center at $(0, 0)$, radius 9

7. center at $(-1, 4)$ and tangent to $x = 3$

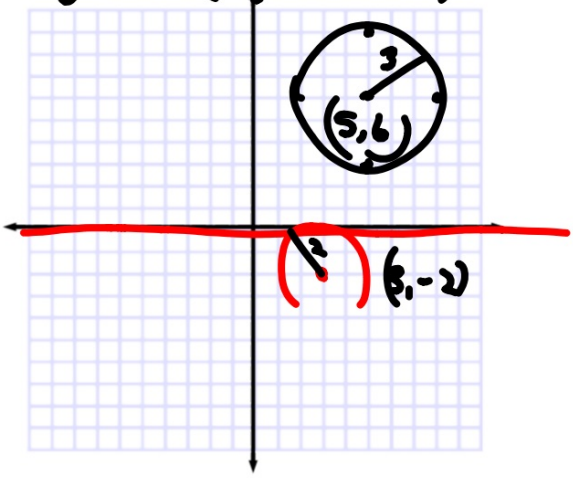
$$(x+1)^2 + (y-4)^2 = 16$$



What do we need to know to answer the question?
One picture is worth 1000 words...

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.**

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



General Form of the Equation of a Circle

The general form of the equation of a circle is

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

where D, E, and F are constants.

Multiply out all terms
Arrange in this order

What do we need to know?

CTS

Write the standard form of each equation. Then graph the equation.

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

9. $2x^2 + 2y^2 - 20x + 8y + 34 = 0$

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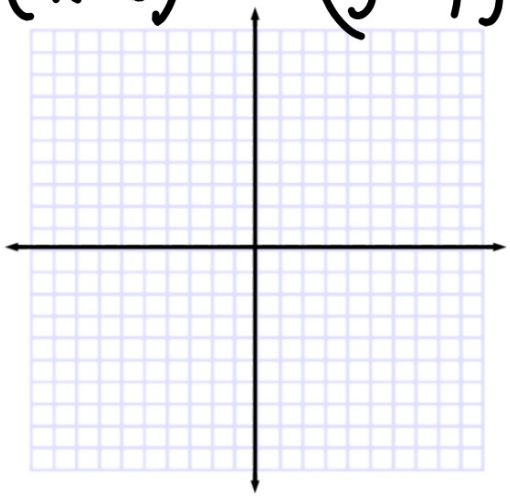
$(x^2-4x+4)+(y^2+14y+49) = 47+4+49$

$(x-2)^2 + (y+7)^2 = 100$

$(x^2-10x)+(y^2+4y)=-7$



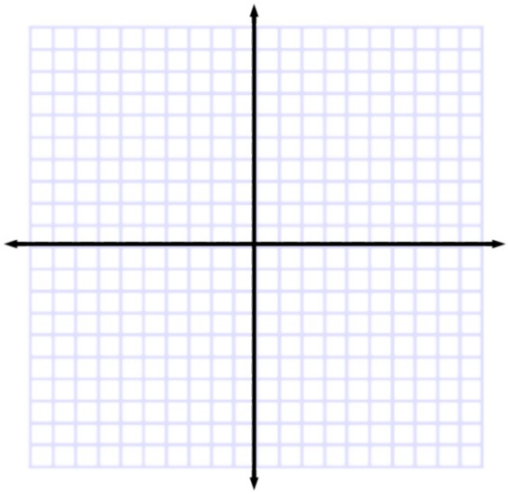
What do we need to know?

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

a. Write the standard form of the equation.

b. Find the radius and the coordinates of the center.

c. Graph the equation.



Tough: system of 3 equations
What do we need to know?

4 **Write the standard form of the equation of the circle that passes through the points at (5, 3), (−2, 2), and (−1, −5). Then identify the center and radius of the circle.**

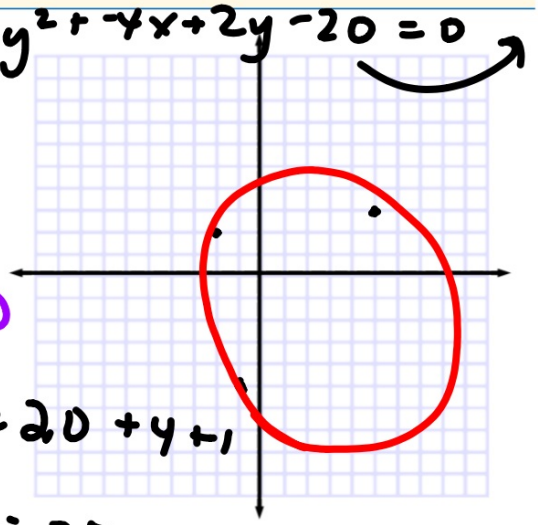
General Form of the Equation of a Circle	The general form of the equation of a circle is $x^2 + y^2 + Dx + Ey + F = 0$, where D, E, and F are constants.

$5^2+3^2+5D+3E+F=0$

$(-2)^2+2^2+-2D+2E+F=0$

$(-1)^2+(-5)^2+-1D+-5E+F=0$

$x^2+y^2+-4x+2y-20=0$



$(x^2-4x+4)+(y^2+2y+1)=20+4+1$

$(x-2)^2+(y+1)^2=25$

Use technology to solve the

How can we leverage technology to help?
Matrices! :)

10.2 15-39 odd