Mini-Lecture 1.4
Circles

Learning Objectives:

1. Write the standard form of the equation of a circle
2. Graph a circle
3. Work with the general form of the equation of a circle

Examples:

1. Write the standard form and general form of the equation of each circle with radius r and center (h,k). Graph each circle.

$(a)\ r=3;\ (h,k)=(-2,3).$ $(b)\ r=\frac{2}{3};\ (h,k)=(0,0).$

2. Find the center (h,k) and radius r of each circle.

$(a)\ 2(x-2)^2+2(y+3)^2=8$ $(b)\ x^2+y^2-6x+2y+4=0$

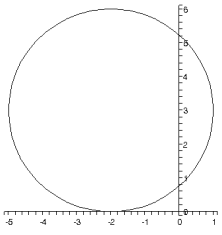
3. Find the general form of the equation of each circle.
   (a) Center (2,-3) and containing the point (0,4).
   (b) Endpoints of a diameter at (6,10) and (-4,-4).

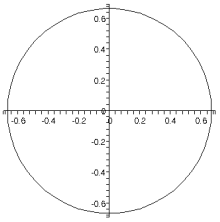
Teaching Notes:

- Show the difference in the equations of circles with centers at the origin and those with centers elsewhere.
- It is not necessary to memorize the general form of the equation.
- Students will need review on completing the square (in order to put the general form into standard form).

Answers:

1. $(a)\ (x+2)^2+(y-3)^2=9;\ x^2+y^2+4x-6y+4=0.$ $(b)\ x^2+y^2=\frac{4}{9};\ x^2+y^2-\frac{4}{9}=0.$





2. $(a)\ c=(2,-3);\ r=2.$ $(b)\ c=(3,-1);\ r=\sqrt{6}.$

3. $(a)\ (x-2)^2+(y+3)^2=53.$ $(b)\ (x-1)^2+(y-3)^2=74.$