2.1 Circles

Practice Tasks

I. Concepts and Procedures

1. A circle is the set of all points in a plane that are equidistant from a fixed point called the _____. The standard equation of a circle is $(x-h)^2 + (y-k)^2 = r^2$ where the center is (_____, _____) and the radius is _____.

2. Find the center and radius of the circle.
   a. $\frac{x^2}{25} + \frac{y^2}{25} = 1$

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

   c. $x^2 + y^2 = 16$

   d. $x^2 - 6x + y^2 + 10y = 24$

   e. $x^2 + 14x + y^2 + 8y = 18$

3. Find an equation for the circle that satisfies the given conditions.
   a. Center at (3 , 0), radius 2

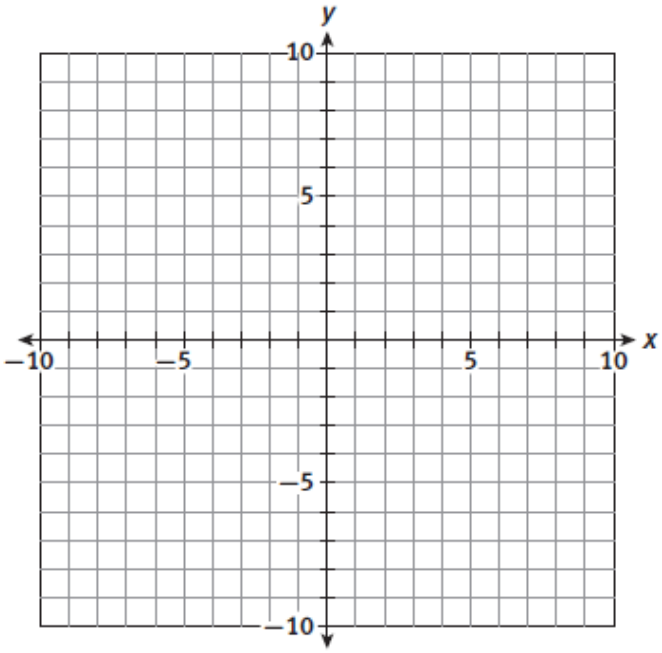
   b. Center at (-1 , 7); diameter 6

   c. Center at (-4 , -3); tangent to $y = 3$

   d. Center at (2 , 0); end points of diameter at (-5 , 0) and (9 , 0)

II. Problem Solving

1. You have been hired to design a crop circle that will be placed as public art in a field of grass near the landing strip of an airport. Use the grid below and create a design using conic sections that can be created in the field. Write the equation for each conic section used in the design.



III. Modeling

1. There are two circles, the first with center (3, 3) and radius r_1, and the second with center (3, 1) and radius r_2.
   a. Find values r_1 and r_2 of so that the first circle is completely enclosed by the second circle.

   b. Find one value of r_1 and one value of r_2 so that the two circles intersect at two points.

   c. Find one value of r_1 and one value of r_2 so that the two circles intersect at exactly one point.