

Geometry Warm-Ups

Thursday, March 9th

A major cellular phone tower sits 9 miles West and 21 miles north of the center of a city. This tower sends out its radiofrequency (RF) waves so the RF waves cover a circular area. Your house sits 23 miles east and 11 miles south of the center of the city and also happens to sit on the edge of the cell phone tower's coverage area. Assuming the center of the city represents the origin, provide a standard form circular equation to represent the cell phone tower's location and coverage area. Hint: Draw a picture!

radius = distance from cell tower to house

$$d = \sqrt{(23 - (-9))^2 + (-11 - 21)^2} = \sqrt{1024 + 1024} = \sqrt{2048}$$

Friday, March 10th

$$(x+9)^2 + (y-21)^2 = 2048$$

Write the standard form equation of a circle $(x-h)^2 + (y-k)^2 = r^2$. Then, convert each standard form equation into general form $Ax^2 + By^2 + Cx + Dy + E = 0$.

a. Center (4, 6) Area = 10π $r^2 = 10$
 $r = \sqrt{10}$

$$(x-4)^2 + (y-6)^2 = 10$$

b. Center (-3, 2) Circumference = 16π $d = 16$ $r = 8$

$$(x+3)^2 + (y-2)^2 = 64$$

c. Center (-3, -5) Point on the circle (-8, 6)
 $x_1 \ y_1$ $x_2 \ y_2$

$$d = \sqrt{(-8 - (-3))^2 + (6 - (-5))^2} = \sqrt{25 + 121} = \sqrt{146} \leftarrow \text{radius}$$

$$(x+3)^2 + (y+5)^2 = 146$$