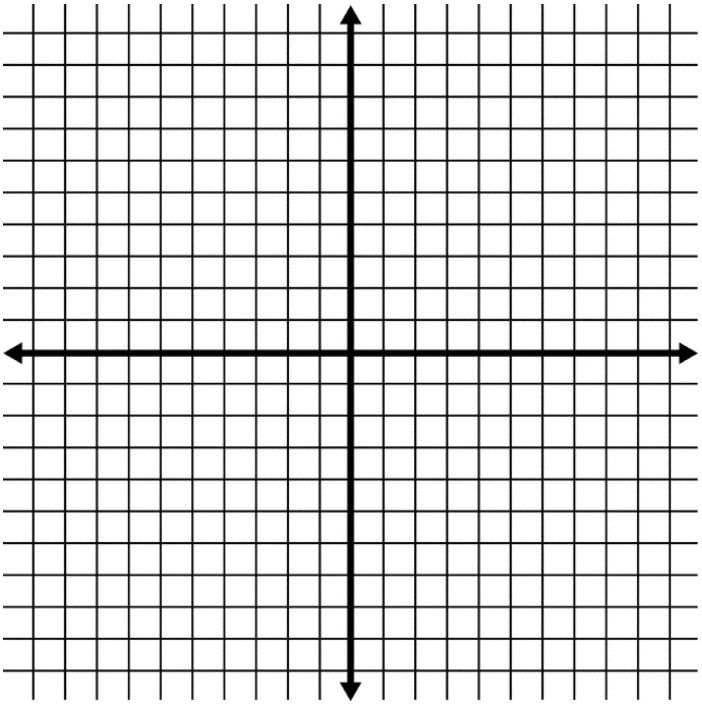
Name_____

Network Circles

Suppose a telecommunications company has hired you as a consultant to test the coverage of their wireless network in a certain U.S. county. The company currently has cell phone towers in the locations described in the table.
Cell phone radio towers broadcast a cell phone signal in a circular pattern. Think about how you could use the equation and graph of a circle to solve these problems.

Tower	Location	Coverage Radius
A	Adams	4 miles
B	5 miles East and 4 miles North of Adams	3 miles
C	4 miles East and 4 miles South of Adams	5 miles



Use the given coordinate grid to show the tower coverage. Assume that each square on the graph represents one mile. Moving in a positive direction on the x-axis shows movement to the East and moving in a positive direction on the y-axis shows movement to the North.

1. Tower A is positioned in the town of Adams, which is in the center of the county. Label that tower and with a chosen color pencil, draw and shade the coverage circle.
2. Write the equation to represent tower's A coverage:

3. Also label the center and coverage circles for towers B and C using different colors.
4. Write the equations to represent tower B's coverage:

   and tower C's coverage:

5. Other towns around Adams are listed in the table below. The location of each town is given in terms of miles and compass directions from Adams. Plot and label each town on the coordinate plane with the coverage circles of towers A, B, and C.
6. Using your points plotted in the coordinate plane, mark on the table if each town is currently covered by any of the towers.
7. The company wants to ensure that all the towns you've plotted receive wireless service. Their construction budget has enough money to build two new towers: tower D with a 4 mile radius and tower E, with a five mile radius. Based on your graph, what is the optimal location for each new tower? Complete the table to show the location, coverage radius and equation for each tower. Also plot those on your graph in new colors.

Town	Directions from Adams	A	B	C
Far	2 miles west and 5 miles north			
Green	7 miles west and 9 miles north			
Home	7 miles west			
Irish	2 miles west and 6 miles south			
Jefferson	8 miles west and 7 miles south			
Kansas	2 miles east and 2 miles north			
Lonely	5 miles east and 6 miles north			
Moore	8 miles east and 6 miles south			
Nowhere	2 miles east and 8 miles south			

Tower	Location	Coverage Radius	Equation
D			
E			