

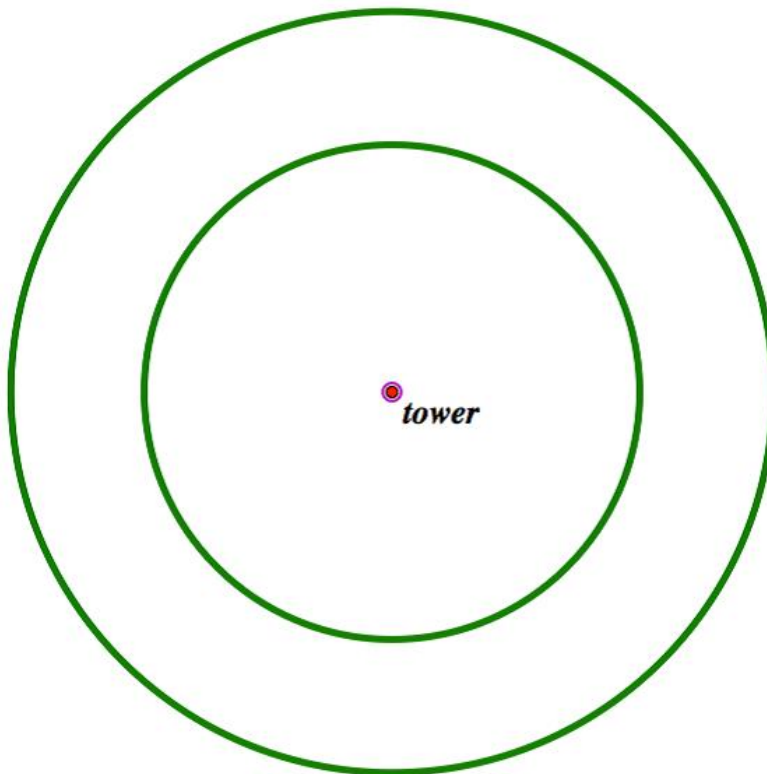
## 1.6 Diggin' It

### *Discovering Radians*

Alyce, Javier, and Veronica are responsible for preparing a recently discovered archeological site. The people who used to inhabit this site built their city around a central tower. The first job of the planning team is to mark the site using stakes so they can keep track of where each discovered item was located.



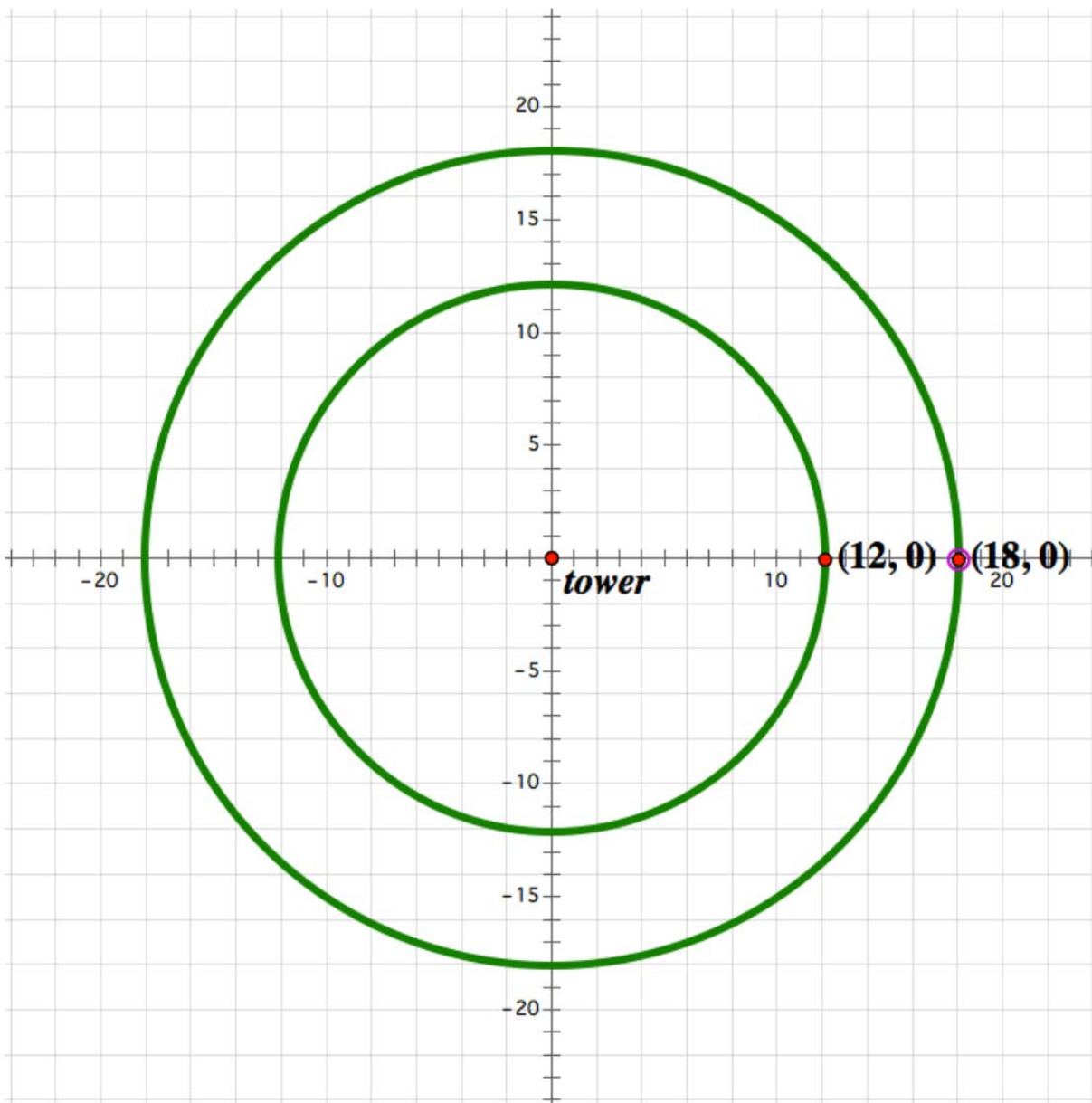
1. Alyce suggests that the team place stakes in a circle around the tower, with the distance between the markers on each circle being equal to the radius of the circle. Javier likes this idea but says that using this strategy, the number of markers needed would depend on how far away the circle is from the center tower. Do you agree or disagree with Javier's statement? Explain.
2. Show where the stakes would be located using Alyce's method if one set of markers were to be placed on a circle 12 meters from the center and a second set on a circle 18 meters from the center.



## Investigation 2:

After looking at the model, Veronica says they need to have more stakes if they intend to be specific with the location of the artifacts. Since most archaeological sites use a grid to mark off sections, Veronica suggests evenly spacing 12 stakes around each circle and using the coordinate grid to label points. Alyce also wants to make sure they record the distance around the circle to each stake. The central tower is located at the origin and the first of each set of 12 stakes for the inner and outer circles is placed at the points  $(12, 0)$  and  $(18, 0)$ , respectively.

Your job is to determine the  $x$  and  $y$ -coordinates for each of the remaining stakes on each circle, as well as the arc length from the points  $(12, 0)$  or  $(18, 0)$ , depending on which circle the stake is located. Keep track of the method(s) you use to find these values. Describe each method in your journal.



### Investigation 3:

Javier suggests they record the location of each stake and its distance around the circle for the set of stakes on each circle. Veronica suggests it might also be interesting to record the ratio of the arc length to the radius for each circle.

Help Javier and Veronica complete this table.

	Inner Circle: $r = 12$ meters			Outer Circle: $r = 18$ meters		
	Location	Distance from (12,0) along circular path	Ratio of arc length to radius	Location	Distance from (18,0) along circular path	Ratio of arc length to radius
Stake 1	(12, 0)	0	0	(18, 0)	0	0
Stake 2						
Stake 3						
Stake 4						
Stake 5						
Stake 6						
Stake 7						
Stake 8						
Stake 9						
Stake 10						
Stake 11						
Stake 12						

5. What interesting patterns might Alyce, Javier and Veronica notice in their work and their table? Summarize any interesting things you have noticed.