|  | **Worksheet - Wireless Hotspot Problem** |  |
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**Solve It!**

## The Problem

A town has decided to provide free wireless access to its citizens. You have been hired to find the best places to install WiFi hotspots throughout the town so that *everyone* has coverage.

It costs $500,000 to install a hotspot, so the town would like to minimize the cost by installing the lowest number of hotspots necessary to give coverage to the *entire* town.

The town has a lot of buildings, trees and other obstacles that interfere with wireless communication, so placement might get tricky.



## A Schematic Diagram of the Town

The town has provided you with the diagram shown to the right. Each **circle** indicates a location in town that *must* be reached by a WiFi signal. The **dotted lines** indicate clear paths where a WiFi signal can travel between circles; these are not blocked or interfered with by trees or buildings.

A hotspot can be placed on a circle and it provides coverage to that circle and any circle it’s connected to by a dotted line.

## What to Do



**Shade in the circles of locations which should have hotspots installed.** When you place a hotspot on a circle, it gives “coverage” to any circles it has a clear path to. The diagram to the right shows one circle filled-in with black to indicate a hotspot placement. It also shows the 4 other circles that get WiFi coverage when a hotspot is placed there.

**The Goal**

Because the town would like to minimize its costs, you must 1) find the *minimum* number of WiFi hotspots that you need to place, and 2) prove that it gives coverage to the whole town by marking on the diagram *where* you need to place them.

The following pages contain a few blank copies of the diagram you can use to work the problem.

