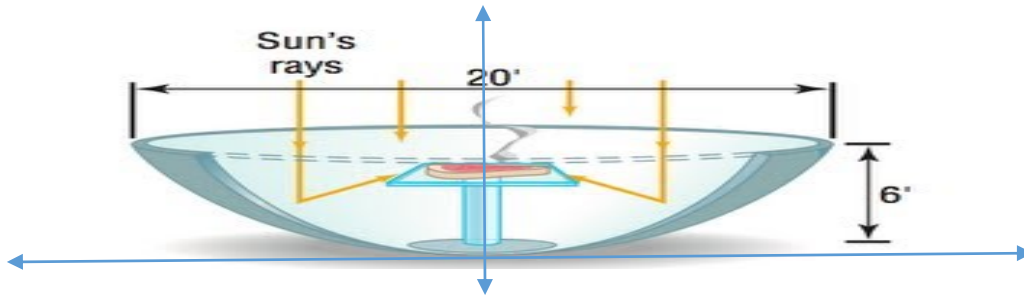


1. Using the terms focus and directrix, write the definition of a parabola.
2. Go to “Defining Parabolas” in unit 2 in Agile Mind. Go to the animation on page 2. Examine the steps on page 3 of the animation and show the steps to simplify:

$$\sqrt{x^2 + (y - p)^2} = y + p$$

3. Write an equation for the function associated with each parabola described.
 - a. The parabola has a focus (5, 0) and directrix $x = -5$.
 - b. The parabola has its axis of symmetry at $x = 4$, vertex at (4, 3) and passes through the point (5, 4).

4. A mirror is shaped so that its cross section is a parabola. This mirror is used to cook food by concentrating the rays of the sun at the focus (creating the heat source). As you can see in the figure, the mirror is 20 feet across at its opening and is 6 feet deep.



- What general equation will model this parabola?
 - What points do you know lie on the parabola?
 - Using your answers from parts a and b, how far from the vertex must the steak be placed? Justify your answer.
 - Write an equation for the parabolic cross section of this mirror.
5. Write an equation for the function associated with each parabola described.
- The parabola has focus $(-4, 0)$ and directrix $x = 4$.
 - The parabola opens upward, has directrix $y = -6$, focus $(0, -2)$, and passes through the point $(1, -2)$.