Extra Practice Worksheet 5.2

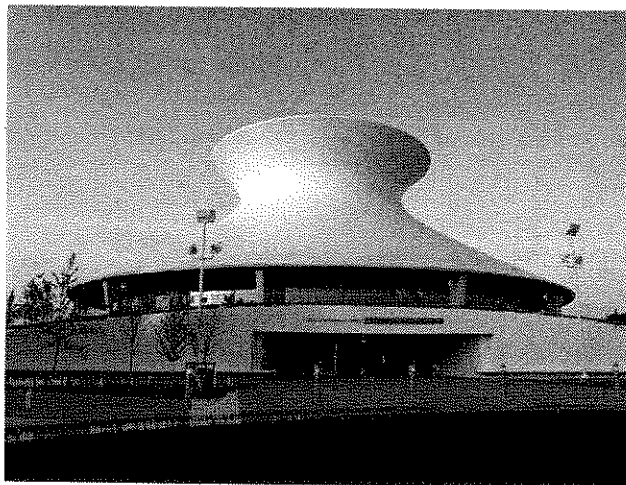Name _____

1. A cross section of a nuclear cooling tower is a hyperbola with equation:

$$\frac{x^2}{90^2} - \frac{y^2}{130^2} = 1$$

The tower is 450 feet tall.   The distance from the top of the tower to the center of the hyperbola is half the distance from the base of the tower to the center of the hyperbola.

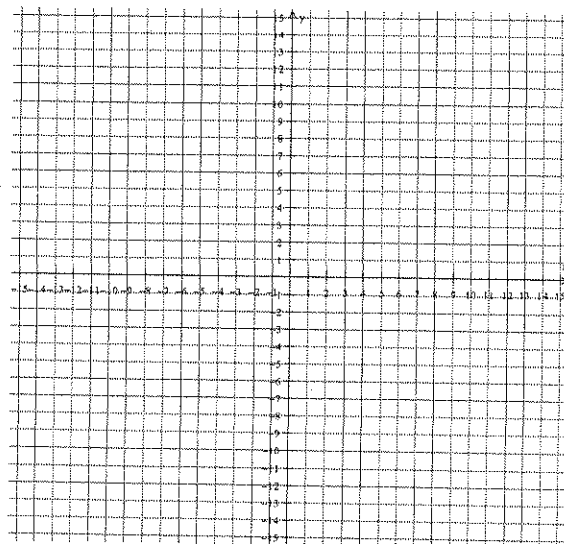Find the diameter of the top and the diameter of the base of the tower.

2. Find the vertex, focus and directrix. Use the focal width to graph.

$$y^2 + 12y - 12x + 60 = 0$$

Vertex:

Focus:

Directrix:

Name _____

1. A cross section of a nuclear cooling tower is a hyperbola with equation:

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The tower is 450 feet tall. The distance from the top of the tower to the center of the hyperbola is half the distance from the base of the tower to the center of the hyperbola.

Find the diameter of the top and the diameter of the base of the tower.
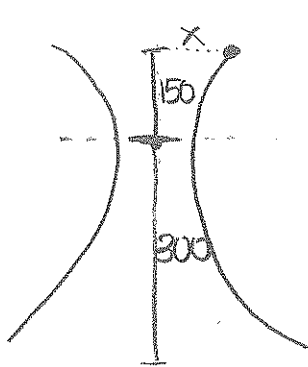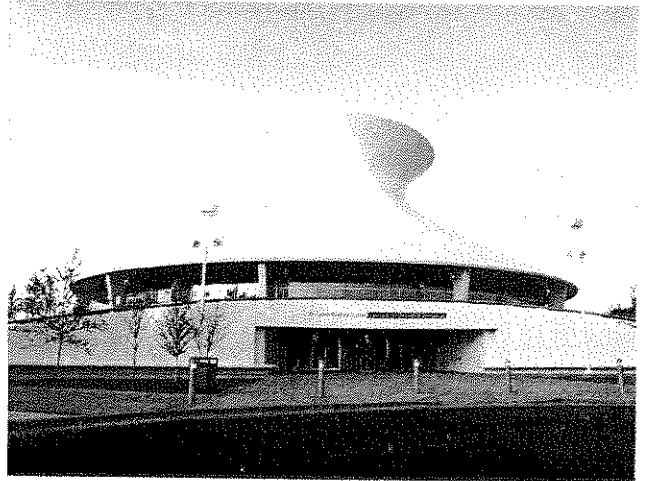
Find x when y=150

$$\frac{x^2}{90^2} - \frac{150^2}{130^2} = 1$$

$$\frac{x^2}{90^2} - \frac{225}{169} = 1$$

$$\frac{x^2}{90^2} = \frac{394}{169}$$

$$x^2 \approx 18884$$

$$x \approx 137.4$$

Diameter of top ≈ 274.8 ft

Find x when y=-300

$$\frac{x^2}{90^2} - \frac{(-300)^2}{130^2} = 1$$

$$\frac{x^2}{90^2} - \frac{900}{169} = 1$$

$$\frac{x^2}{90^2} = \frac{1069}{169}$$

$$x^2 \approx 51236.1$$

$$x \approx 226.4$$

Diameter of bottom ≈ 452.7

2. Find the vertex, focus and directrix. Use the focal width to graph.

$$y^2 + 12y - 12x + 60 = 0$$

$$y^2 + 12y = 12x - 60$$

$$(y+6)^2 = 12x - 60 + 36$$

$$(y+6)^2 = 12x - 24$$

$$(y+6)^2 = 12(x-2)$$

$$12 = 4p$$

$$p = 3$$

Vertex: $(2, -6)$

Focus: $(5, -6)$

Directrix: $x = -1$