Name:_____   Date: _____   Block:_____

Investigation: Mirror, Mirror

Description: Choose a tall object with a height that would be difficult to measure directly, such as a football goalpost, a basketball hoop, a flagpole, or the height of your classroom

Materials:

➤ meter sticks
➤ masking tape or a soluble pen
➤ a mirror

Step 1: Mark crosshairs on your mirror. Use tape or a soluble pen. Call the intersection point *x*. Place the mirror on the ground several meters from your object.

Step 2: An observer should move to a point *P* in line with the object and the mirror in order to see the reflection of an identifiable point *F* at the top of the object at point *X* on the mirror. Make a sketch of your setup, like this one.

Step 3: Measure the distance $\overline{PX}$ and the distance from *x* to a point *B* at the base of the object directly below *F*. Measure the distance from *P* to the observer's eye level, *E*.

$$m\overline{PX}=\text{_____}$$

$$m\overline{PE}=\text{_____}$$

Step 4: Think of $\overline{FX}$ as a light ray that bounces back to the observer's eye along $\overline{XE}$. Why is $\angle B \cong \angle P$? Name two similar triangles. Tell why they are similar.

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Step 5: Set up a proportion using corresponding sides of similar triangles. Use it to calculate *FB,* the approximate height of the tall object.

Step 6: (On the back of this Paper) Write a summary of what you and your group did in this investigation. Discuss possible causes for error.