Name:_____   September 25, 2013

Geometry: Angles near Black Holes
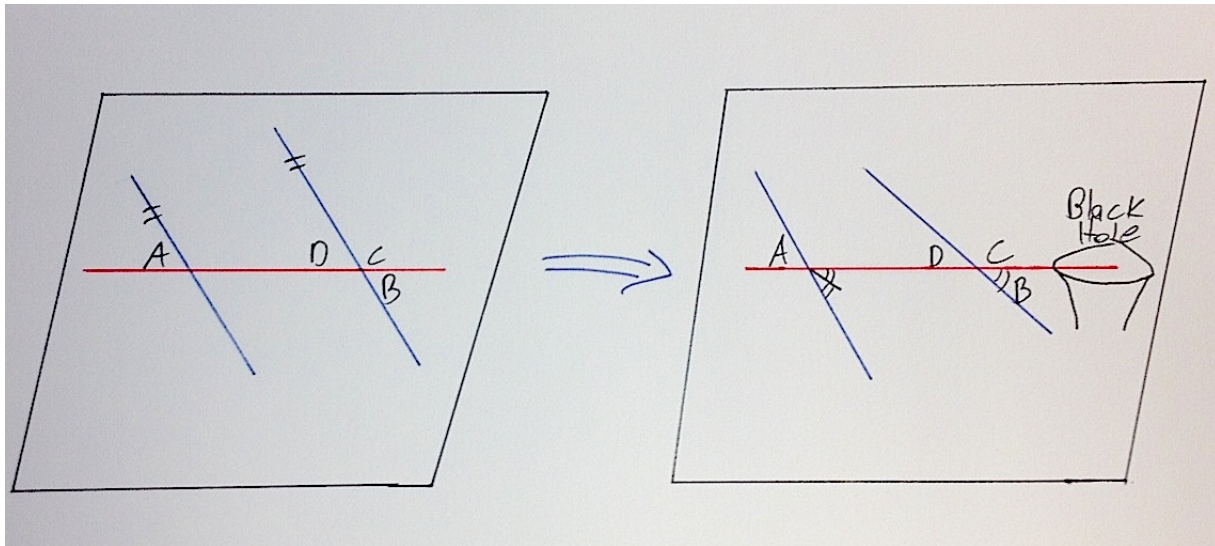
1 The Setup

Figure 1: On the left, two lines (in blue) run parallel to one another, and intersect a third line (red). On the right, a black hole is hovering near the lines, altering how the angles are measured. The black hole is close enough that it shrinks ∠ B until to half the size it was.

2 Problems

1. If $\angle A = 40°$, how large are the other angles when there is no black hole?

   - $\angle B =$ $\angle C =$ $\angle D =$

2. In your own words, explain why the black hole changes ∠ B above? Why does it shrink?

3. If you were to guess, how close do you think you'd have to be to a black hole as massive as our sun for $\angle B$ to shrink to half it's size?

4. Now we've put a black hole to the right of the two lines, such that $\angle B$ is half as big as it used to be. What are the sizes of the other angles now?

   - $\angle A =$ $\angle C =$ $\angle D =$