**Geometry**

**Chapter 8 Open Response Question**

 **Two towns, Town A and Town B, are on opposite sides of a forest. Surveyors have laid out the map shown. The road can be built through the forest or around the forest through Point F. The line joining Town A to Town B is parallel to CD.**

**Find the distance between the towns through the forest.**

**Find the distance from Town A to Town B through Point F.**

**If it costs $4.5 million per mile to build the road around the forest and $6.2 million per mile to build the road through the forest, which road would be cheaper to build?**

Town A

Town B

 C

D

 1.4mi

 1.2mi

 7.5mi

 F

 Forest

**Geometry**

**Chapter 8 Open Response**

**Scoring Guide and Rubric**

**One point: Triangles are similar.**

**One point: Reason why triangles are similar. (AA)**

**One point: Sets up proportion correctly. (1.2/7.5=1.4/AB)**

**One point: Solves for AB. (8.75)**

**Therefore, the distance from Town A to Town B is 8.75 miles.**

**One point: Student establishes that triangle AFB is a right triangle.**

**One point: Student uses the Pythagorean Theorem to find AF or a trig ratio. (AF is approx. 4.51)**

**One point: The distance from Town A to Town B through point F would be found as follows: AF+FB= distance; 4.51+7.5=12.01**

**Therefore, the distance around the forest through point F is 12.01 miles.**

**One point: Student computes the cost to build a road through the forest. ($54.25 million)**

**One point: Student computes the cost to build the road around the forest. ($54.045 million)**

**One point: Student concludes that it is cheaper to build a road around the forest.**

**Total points: 10**

**Score:**

1. **10 points**
2. **8 or 9 points**
3. **4 to 7 points**
4. **1 to 3 points**

 **0- 0 points or blank**