

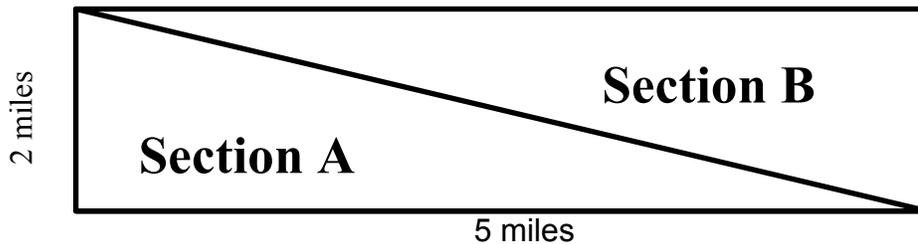
Name: _____

Contestant Number: _____

School: _____

**University of Wyoming "Cowboy Classic" Fall 2013
Agriculture Technology and Mechanical Systems Career Development Event
Environmental and Natural Resource System Activity**

You are hired as an environmental manager by Trees Inc., a local logging company. Your logging company has just received a contract to harvest an area of the Snowy Range near Fox Park. Your job requires you to determine the land area to be harvested and replanted, as well as reporting your activities to the Forest Service as stated in the contract. Below are several questions and scenarios that the department requires you to report before the company is allowed to begin harvesting.



1. The contract allows your company to harvest Section A of the map above. Determine the size of the area to be harvested. **(3 points)**

$$(2 \text{ miles} \times 5 \text{ miles})/2 = 5 \text{ square miles}$$

2. The highest point of Section A is rock cliff, and the company will not be harvesting trees in this area. This area is estimated to cover 1.75 square miles. What is the total land area the company will be able to harvest from? **(3 points)**

$$5 \text{ square miles} - 1.75 \text{ square miles} = 3.25 \text{ square miles}$$

3. The tree population is estimated at 42,100 per square mile with 15% beetle kill. The contract requires you to harvest 25% of the beetle killed area. Determine the number of beetle kill trees the company is required to remove. **(3 points)**

$$42,100 \text{ trees} \times 15\% \times 25\% \times 3.25 \text{ square miles} = 5,131 \text{ trees}$$

4. The contract allows the company to harvest 78% of the population, and 6% of the harvest must be left as ground litter for erosion control. How many trees will the company be able to remove from the area? Tree Population – 42,100 per sq. mile **(3 points)**

$$78\% - 6\% = 72\% \times 42,100 \text{ trees} \times 3.25 \text{ square miles} = 98,514 \text{ trees}$$

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5. The contract determines that the main access roads to the logging area must be reseeded. Determine the number of pounds of seed the company will have to purchase. The application rate is 18 pounds per 43,560 square feet. The road is 12 feet wide and 2.5 miles long. (Note: 5280 feet in a mile). **(4 points)**

$$\begin{aligned} 12 \text{ feet} \times (2.5 \times 5280 \text{ feet}) &= 158,400 \text{ square feet of road} \\ 43,560 \text{ square feet} / 18 \text{ pounds} &= 2420 \text{ square feet per pound} \\ 158,400 \text{ square feet} / 2420 \text{ square feet per pound} &= 65.45 \text{ pounds or } 66 \text{ pounds} \end{aligned}$$

6. The company must purchase seeds to be replanted. Using the number determined in the problem above, determine the costs of the seedlings to be replanted. The forest seed mix is approximately \$100 per bulk pound. **(3 points)**

$$65.45 \text{ pounds} \times \$100 \text{ per pound} = \$6,545$$

or

$$66 \text{ pounds} \times \$100 \text{ per pound} = \$6,600$$

7. List possible solution(s) and/or action(s) the timber company will do in order to reduce soil compaction. **(3 points)**

-aeration

-proper tire pressure

-alternative means of removing logs

-properly covered roads (gravel, etc.)

8. There are several homes located in a small part of the section you are to harvest. The contract states that you are required to help protect the area around the homes from the Mountain Pine Beetle. Your company has purchased the product Onyx to spray the surrounding trees. The estimated tree count to spray is 150. Each tree will be sprayed with 4 gallons of spray. How much will you need to mix? **(4 points)**

$$150 \text{ trees} \times 4 \text{ gallons per tree} = 600 \text{ gallons}$$

9. The company wants to use the lowest ratio of mixture for prevention. Using the Onyx label information, determine the amount of pesticide needed to mix to reach the appropriate amount of spray for the area. **(4 points)**

1.0 pint per 100 gallons

$$600 \text{ gallons} / 100 \text{ gallons} = 6.0 \text{ pints}$$