Name: _____ Date: _____

UNIT 6 **LESSON 7**

AIM: APPLICATIONS OF FINDING SIDES AND ANGLES USING SOHCAHTOA (DAY 2)

Do Now:

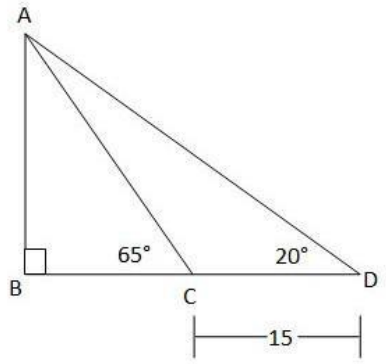
1. Find the length, to the nearest tenth of a cm, of the altitude(height) of an equilateral triangle given the side length measures 10 cm.

2. Find the length, to the nearest tenth of a cm, of the altitude(height) of an equilateral triangle given the side length measures 16 cm.

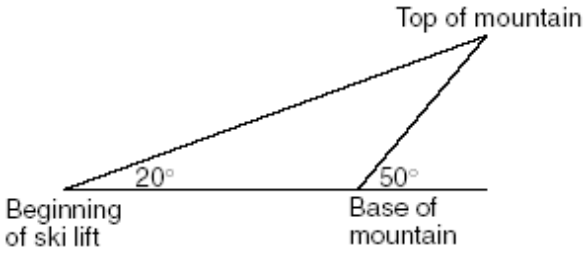
RECALL: Using Law of Sines to Find Sides in Double Triangles
1. Find all missing angles (Linear pair, angles in a triangle) 2. Find shared side first (Label 'y')- 3. Set up proportion $\frac{side}{\sin(opposite\ angle)} = \frac{side}{\sin(opposite\ angle)}$ 4. Cross multiply (make sure you write the number or variable BEFORE sine! 5. Using the side you just found ('y'), set up Law of Sines a second time to find 'x'

PRACTICE:

1. Find AB.



2. A ski lift begins at ground level 0.75 mile from the base of a mountain whose face has a 50° angle of elevation, as shown in the accompanying diagram. The ski lift ascends in a straight line at an angle of 20°. Find the length of the ski lift from the beginning of the ski lift to the top of the mountain, to the *nearest hundredth of a mile*.



3. Carmen and Jamal are standing 5,280 feet apart on a straight, horizontal road. They observe a hot-air balloon between them directly above the road. The angle of elevation from Carmen is 60° and from Jamal is 75°. Draw a diagram to illustrate this situation and find the height of the balloon to the *nearest foot.*

4. As Mr. Fox strolls down 34th street, he glances up at the Empire State Building, and estimates the angle of elevation of his view to be $53.6°$. After walking closer to the building, he makes another estimation of $64.7°$. Knowing that the Empire State Building is 1250 feet tall, how far, *to the nearest foot*, was he from the building at each of the two locations where he took his estimates?

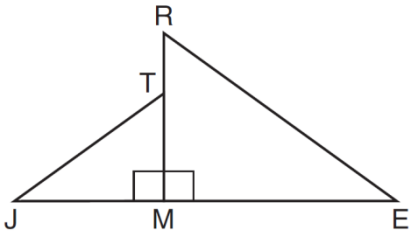
Name: _____ Date: _____

UNIT 6 **LESSON 7**

HOMEWORK

1. Find the length, to the nearest hundredth of a cm, of the altitude(height) of an equilateral triangle given the side length measures 9 cm.

2. In the diagram below, $\triangle ERM \sim \triangle JTM$. Which statement is always true?



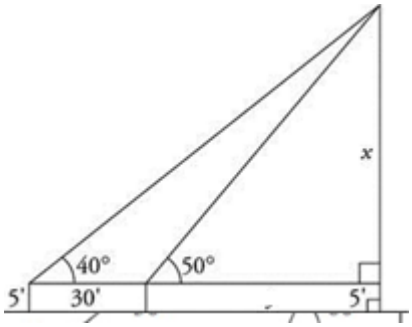
1) $\cos J = \frac{RM}{RE}$

2) $\cos R = \frac{JM}{JT}$

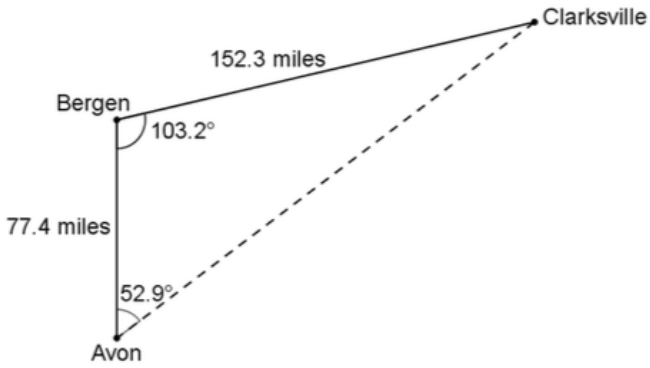
3) $\tan T = \frac{RM}{EM}$

4) $\tan E = \frac{TM}{JM}$

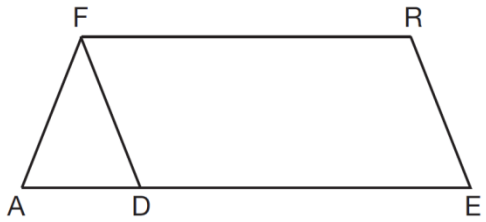
3. Find x:



4. As shown in the map below, it is possible to get from Avon to Clarksville by traveling first to Bergen and then to Clarksville. The state department wants to build a straight highway to connect Avon directly to Clarksville. To the *nearest tenth of a mile*, the length of the new highway from Avon to Clarksville will be



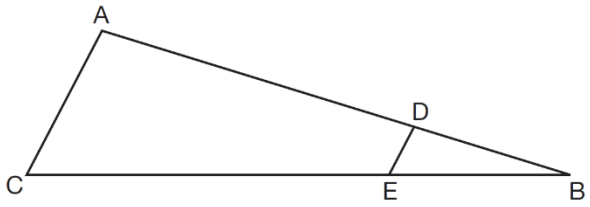
5. In the diagram of parallelogram *FRED* shown below, $\overline{ED}$ is extended to *A*, and $\overline{AF}$ is drawn such that $\overline{AF} \cong \overline{DF}$.



If $m\angle R = 124°$, what is $m\angle AFD$?

(1) 124°
(3) 68°
(2) 112°
(4) 56°

6. In the diagram of $\triangle ABC$, points *D* and *E* are on $\overline{AB}$ and $\overline{CB}$, respectively, such that $\overline{AC} \parallel \overline{DE}$.
If $AD = 24$, $DB = 12$, and $DE = 4$, what is the length of $\overline{AC}$?



(1) 8
(3) 16
(2) 12
(4) 72