

**Get a calculator.*

**Get in your assigned seat.*

**Get your homework out.*

**Create a 2 right triangles. In 1 calculate the length of a side. In the other calculate the measure of an angle. (Use Trig.)*

1. As shown below, a canoe is approaching a lighthouse on the coastline of a lake. The front of the canoe is 1.5 feet above the water and an observer in the lighthouse is 112 feet above the water.



At 5:00, the observer in the lighthouse measured the angle of depression to the front of the canoe to be 6° . Five minutes later, the observer measured and saw the angle of depression to the front of the canoe had increased by 49° . Determine and state, to the nearest foot per minute, the average speed at which the canoe traveled toward the lighthouse.

$$\tan 84 = \frac{x}{110.5} \quad \text{---} \quad \tan 35 = \frac{84}{110.5}$$

$$110.5(\tan 84) = 110.5(\tan 35)$$

$$1051.34 = 77.37$$

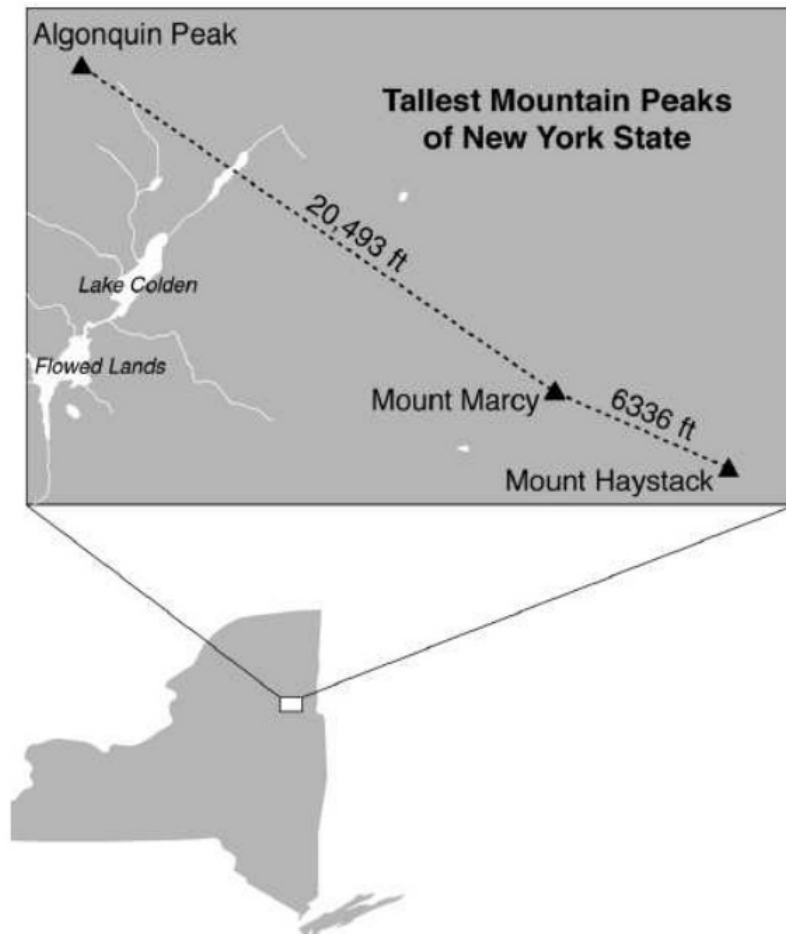
$$973.967 \div 5 = 195 \text{ ft/min}$$

2. A man who is 5 feet 9 inches tall casts a shadow of 8 feet 6 inches. Assuming that the man is standing perpendicular to the ground, what is the angle of elevation from the end of the shadow to the top of the man's head, to the nearest tenth of a degree?

- (1) 34.1
- (2) 34.5
- (3) 42.6
- (4) 55.9

3. In right triangle ABC with the right angle at C , $\sin A = 2x + 0.1$ and $\cos B = 4x - 0.7$. Determine and state the value of x . Explain your answer.

4. The map below shows the three tallest mountain peaks in New York State: Mount Marcy, Algonquin Peak, and Mount Haystack. Mount Haystack, the shortest peak, is 4960 feet tall. Surveyors have determined the horizontal distance between Mount Haystack and Mount Marcy is 6336 feet and the horizontal distance between Mount Marcy and Algonquin Peak is 20,493 feet.



The angle of depression from the peak of Mount Marcy to the peak of Mount Haystack is 3.47 degrees. The angle of elevation from the peak of Algonquin Peak to the peak of Mount Marcy is 0.64 degrees. What are the heights, to the *nearest foot*, of Mount Marcy and Algonquin Peak? Justify your answer.