

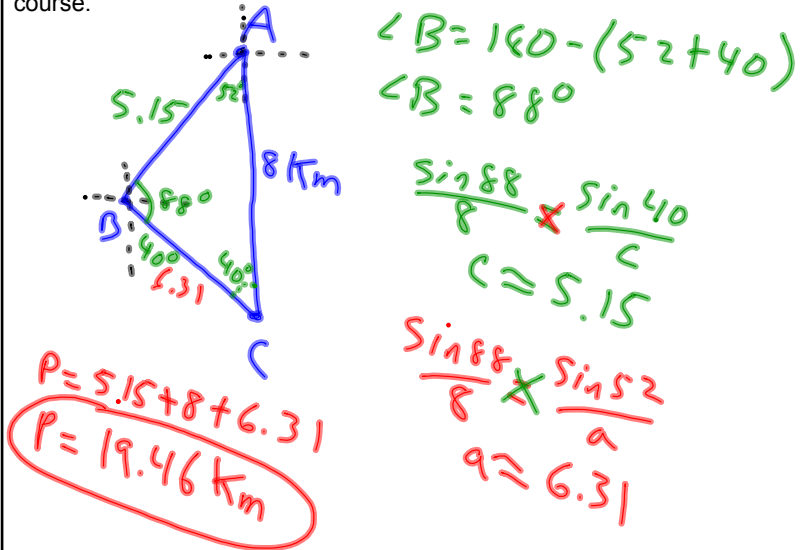
6-1 day 2

I. Area of a Triangle:

$$\text{Area} = \frac{1}{2} bc \sin A = \frac{1}{2} ab \sin C = \frac{1}{2} ac \sin B$$

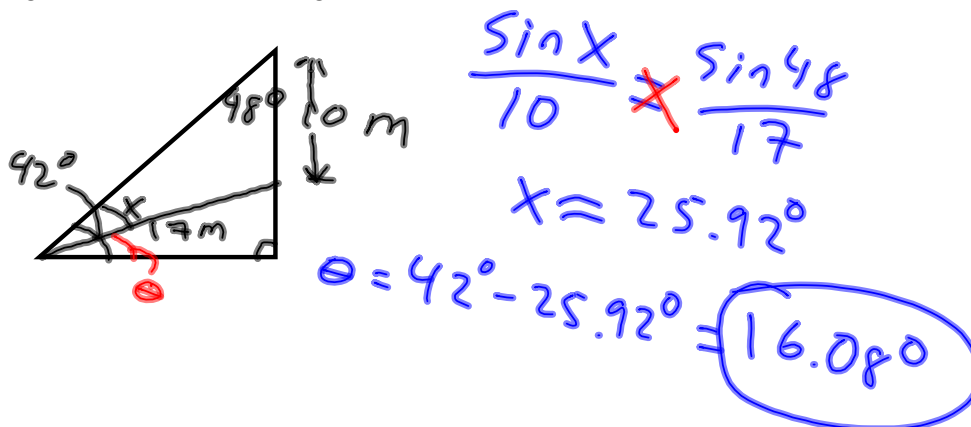
II. Story Problems

Ex 2) The course for a boat race starts at point A and proceeds in the direction S 52 W to point B, then in the direction of S 40 E to point C, and finally back to A. Point C lies 8 km directly south of Point A. Approximate the total distance of the race course.



Ex 3) see picture on page 399, #35

Angle of Elevation: A 10-meter telephone pole casts a 17-meter shadow directly down a slope when the angle of elevation of the sun is 42 degrees. Find θ , the angle of elevation of the ground.



Ex 4) **Railroad Track Design:** The circular arc of a railroad curve has a chord of length 3000 feet and a central angle of 40 degrees.

A) Draw a diagram that visually represents the problem. Show the known quantities on the diagram and use the variables r and s to represent the radius of the arc and the length of the arc, respectively.



$$180 - 40 = 140 \div 2 = 70^\circ$$

B) Find the radius r of the circular arc.

$$180 - 40 = 140 \div 2 = 70^\circ$$

$$\frac{\sin 40}{3000} \times \frac{\sin 70}{r} \Rightarrow r \approx 4385.71 \text{ ft}$$

C) Find the length s of the circular arc.

$$\theta = \frac{s}{r}$$

$$40^\circ \cdot \frac{\pi}{180} = \frac{4\pi}{18} = \frac{2\pi}{9}$$

$$\frac{2\pi}{9} \times \frac{s}{4385.71}$$

$$s = \frac{(2\pi)(4385.71)}{9}$$

$$s \approx 3061.8 \text{ ft}$$