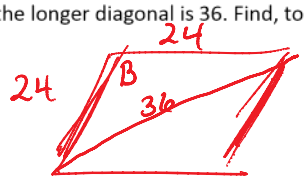
Law of Cosine Applications

Thursday, January 30, 2014
8:33 PM

Honors Precalculus
Law of Cosines Application problems

Name_____

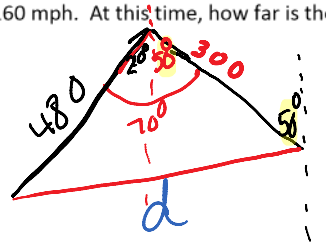
1. In a rhombus with a side of 24, the longer diagonal is 36. Find, to the *nearest degree*, the larger angle of the rhombus.



$36^2 = 24^2 + 24^2 - 2(24)(24)\cos B$

$B = 97.18^\circ$

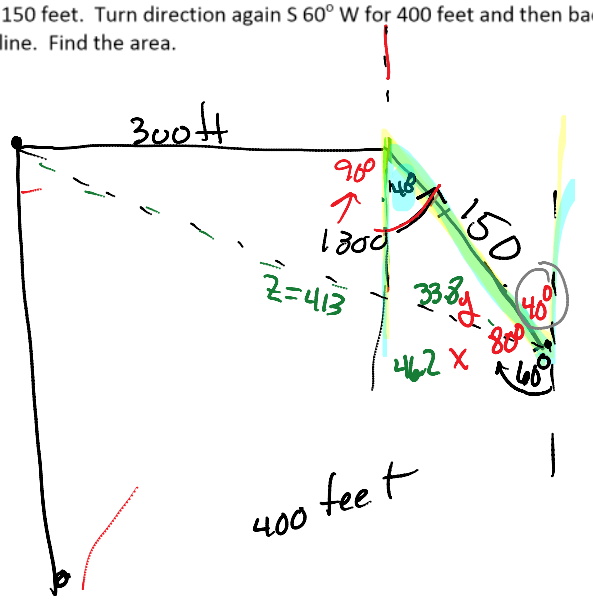
2. A plane proceeds on a course of 310° for 2 hours at 150 mph. It then changes direction to 200° continuing for 3 more hours at 160 mph. At this time, how far is the ~~ship~~ plane from its starting point?



$d^2 = 480^2 + 300^2 - 2(480)(300)\cos 70^\circ$

$d = 471$ miles

3. A post is driven in a certain spot. Proceed due east for 300 ft, then proceed S 40° E for another 150 feet. Turn direction again S 60° W for 400 feet and then back to the post in a straight line. Find the area.



$A_s = \frac{1}{2}(300)150\sin 130^\circ$

$= 17236$ sq. ft.

$z^2 = 300^2 + 150^2 - 2(300)(150)\cos 130^\circ$

$x = 413$

$\frac{\sin 130}{413} = \frac{\sin y}{300}$

$A_\Delta = \frac{1}{2}(413)(400)\sin(46.2)$

$= 59617$

Total Area = 76853 sq. ft.