I. Given the indicated parts of a right triangle ABC with $C = 90^\circ$, solve the triangle. Show your sketch of the triangle. Approximate the missing sides and angles to the nearest hundredth.

1. $A = 37^\circ$, $b = 24$

2. $a = 25$, $b = 45$

II. Draw a picture, write an equation and then solve for the requested information to the nearest hundredth.

3. A guy wire is attached to the top of a radio antenna and to a point on horizontal ground that is 40 meters from the base of the antenna. If the wire makes an angle of 58° with the ground, approximate the length of the wire.

4. An airplane takes off at a 10° angle and travels at the rate of 250 feet per second. Approximately how long does it take the airplane to reach an altitude of 15,000 feet?

5. Approximate the angle of elevation $\alpha$ of the sun if a person 5 feet tall casts a shadow 4 feet long on level ground.
6. A builder wishes to construct a ramp 24 feet long that rises to a height of 5 feet above level ground. Approximate the angle that the ramp should make with the horizontal.

\[ \sin \theta = \frac{5}{24} \]

\[ \theta = 12.02^\circ \]

7. A ship is 50 miles east and 35 miles south of port. If the captain wants to sail directly to port, what bearing should be taken?

\[ \tan \alpha = \frac{50}{35} \]

\[ \alpha = 55.01^\circ \]

N 55.01° W

8. A ship leaves port at 1:00 P.M. and sails in the direction N34°W at a rate of 24 mi/hr. Another ship leaves port at 1:30 P.M. and sails in the direction N56°E at a rate of 18 mi/hr.

a) Approximately how far apart are the ships at 3:00 P.M.?

b) What is the bearing, to the nearest degree, from the first ship to the second?

\[ a) \ 48^2 + 27^2 = d^2 \]

\[ d = 55.07 \text{ mi} \]

\[ b) \ \tan \alpha = \frac{27}{48} \]

\[ \alpha = 29.36^\circ \]

N 68.36° E

\[ \frac{29.36^\circ + 34^\circ}{63.36^\circ} \]