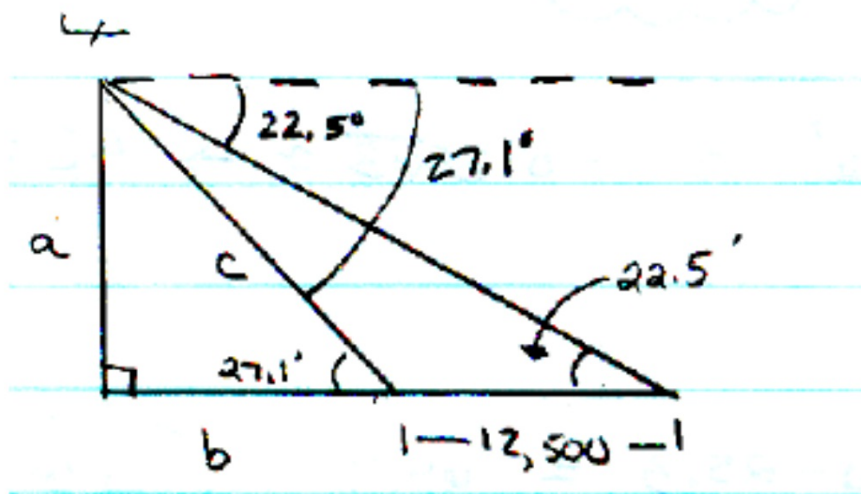
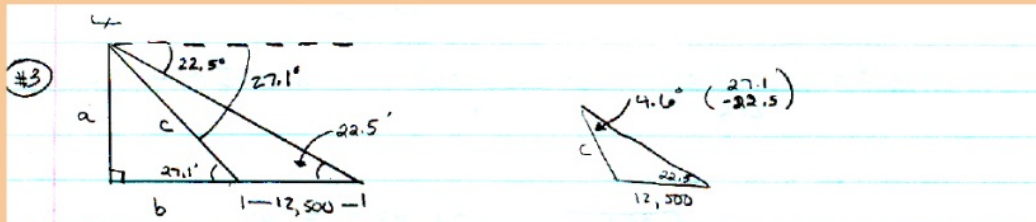


Law of Sines and Cosines Word Problems

**HW: PAGE 503 #37, 48, 57
PAGE 511 #33, 35, 39**

3. A pilot has just started on the glide path for a landing at a point where the length of the runway is 12,500 feet. The angles of depression from the plane to the ends of the runway are 22.5° and 27.1° . Round answers to each of the following to the nearest tenth of a mile.
- Draw a picture that represents the problem
 - Determine the air distance the plane must travel to land on the runway
 - Determine the ground distance the plane travels before touching down.
 - Determine the altitude of the plane.





b) c is air dist.

$$c = \frac{12,500 \sin 22.5}{\sin 4.6} \approx 59,456 \text{ ft} \approx 11.2966 \text{ mi} \approx 11.3 \text{ mi}$$

c)

$$b = \frac{11.3 \sin 62.9}{\sin 90} \approx 10.05 \approx 10.1 \text{ miles}$$

d) **sol'n 1** Law of sines, using C

$$a = \frac{c \sin A}{\sin C} = \frac{11.3 \sin 27.1}{\sin 90} \approx 5.14766 \approx 5.1 \text{ mi}$$

sol'n 2 Law of sines, using b

$$a = \frac{b \sin A}{\sin B} = \frac{10.0 \sin 27.1}{\sin 62.9} \approx 5.1173 \approx 5.1 \text{ mi}$$

sol'n 3 Pythag. Theo.

$$a = \sqrt{c^2 - b^2}$$

$$= \sqrt{11.3^2 - 10^2}$$

$$\approx 5.2621$$

$$\approx 5.3 \text{ mi}$$