

7.4 – Oblique (Non-Right) Triangle Word Problems

– Complete the table below for each oblique triangle word problem:

Given Word Problem (Example)	Picture (including labels)	Show Work / Put Answer Here
1.) A bridge is to be built across a small lake from a gazebo to a dock. The angle formed at the gazebo is 49° . From a tree 100 meters from the gazebo, two angles are formed. What is the length of the bridge?		$\frac{100}{\sin 85} = \frac{x}{\sin 46}$ $x \sin 85 = \frac{100 \sin 46}{\sin 85}$ $x = 72.2 \text{ m}$
2.) Two planes are flying away from each other with different angles from their initial split in the air. One plane is flying at 425 mph and the other plane is traveling at 530 mph. How far apart will the planes be in 2 hours?		$x^2 = 850^2 + 1060^2 - 2(850)(1060)\cos 72$ $\sqrt{x^2} = \sqrt{1289251.376}$ $x = 1135.5 \text{ miles}$
3.) Angie has a triangular backyard with a circular pool with a radius of 5.6 feet. A diagram of her backyard is given where Angie's house is 30 feet wide. What is the probability of a bird landing on the grass of her backyard?		$\text{Probability} = \frac{\text{Area } \Delta - \text{Area } O}{\text{Area } \Delta}$ $\textcircled{1} \frac{30}{\sin 56} = \frac{a}{\sin 51} \rightarrow a = 35.7 \text{ ft}$ $\textcircled{2} \text{Area } \Delta = \frac{1}{2}(30)(35.7)\sin 43$ $A = 365.2 \text{ ft}^2$ $\textcircled{3} \text{Area } O = \pi(5.6)^2 \rightarrow A = 98.5 \text{ ft}^2$ $\textcircled{4} \text{Probability of grass} = \frac{365.2 - 98.5}{365.2} = 73\%$
4.) How far is the lighthouse from the shore?		$\textcircled{1} \frac{750}{\sin 18} = \frac{x}{\sin C} \rightarrow C = 55.5^\circ$ $\textcircled{2} D = 180 - 106.5 \rightarrow D = 73.5^\circ$ $\textcircled{3} \sin 73.5 = \frac{x}{2000}$ $x = 2000 \sin 73.5$ $x = 1917.6 \text{ ft}$
5.) Trevor, Robert, and Maurice are throwing a baseball to each other. Trevor is 14 feet from Robert, Robert is 12 feet from Maurice, and Maurice is 9 feet from Trevor. What angle is formed between Robert and Maurice?		$12^2 = 14^2 + 9^2 - 2(14)(9)\cos T$ $144 = 277 - 252\cos T$ $-133 = -252\cos T$ $\frac{-133}{-252} = \cos T$ $T = \cos^{-1}\left(\frac{-133}{-252}\right) \rightarrow T = 58.1^\circ$
6.) A horse corral is to be situated on a triangular piece of land. Two sides of the plot are 143 feet long and they meet at an angle of 54° . A fence is to be placed along the plot of land to form the corral. How much fencing is needed for the corral?		$\textcircled{1} \frac{143}{\sin 63} = \frac{c}{\sin 54}$ $\frac{c \sin 63}{\sin 63} = \frac{143 \sin 54}{\sin 63}$ $c = 129.8 \text{ ft}$ $\textcircled{2} \text{fencing} = 143 + 143 + 129.8$ $= 415.8 \text{ ft}$