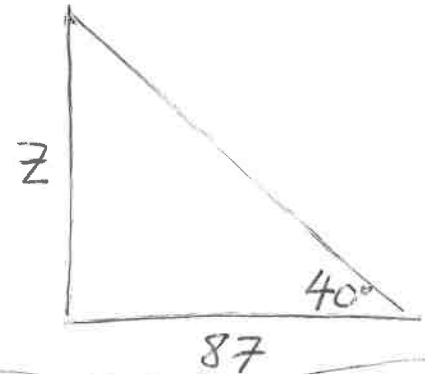
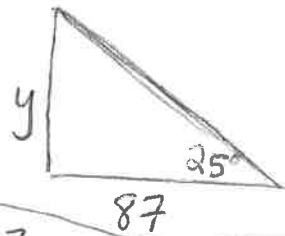
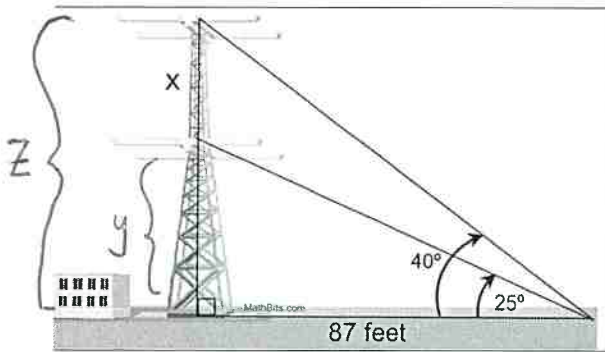


Accel Pre-Calc: Trig Word Problem Practice WS (Double Triangles)

Key

1. A radio station tower was built in two sections. From a point 87 feet from the base of the tower, the angle of elevation of the top of the first section is 25° , and the angle of elevation of the top of the second section is 40° . To the nearest foot, what is the height of the top section of the tower?



$$\tan(25) = \frac{y}{87}$$

$$\tan(40) = \frac{z}{87}$$

$$y = 87 \tan(25)$$

$$z = 87 \tan 40$$

$$y = 40.569$$

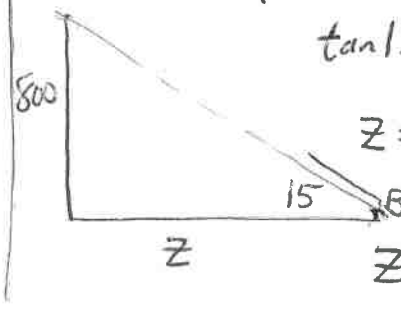
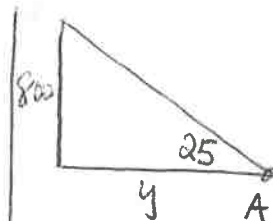
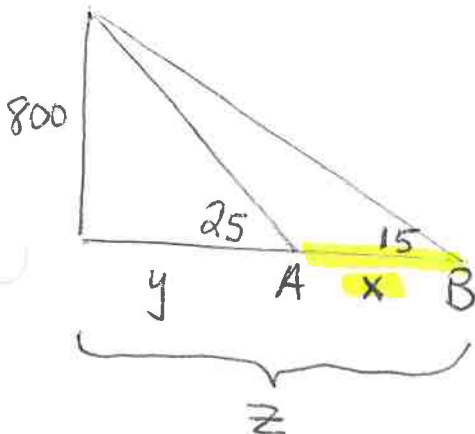
$$z = 73.002$$

$$x = z - y$$

$$x = 73.002 - 40.569$$

$$x = 32.432 \approx \boxed{32 \text{ feet}}$$

- 2) You are standing on a plateau that is 800 feet above a basin where you see two hikers. If the angle of depression to the hikers is 25° and 15° , how far apart are the two hikers, rounded to the nearest hundredth of a foot?



$$\tan 25 = \frac{800}{y}$$

$$y = \frac{800}{\tan 25} = 1715.606$$

$$\tan 15 = \frac{800}{z}$$

$$z = \frac{800}{\tan 15}$$

$$z = 2985.641$$

distance x =

$$x = z - y$$

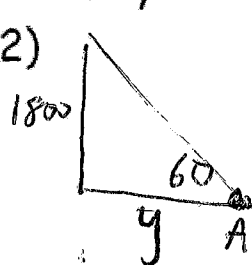
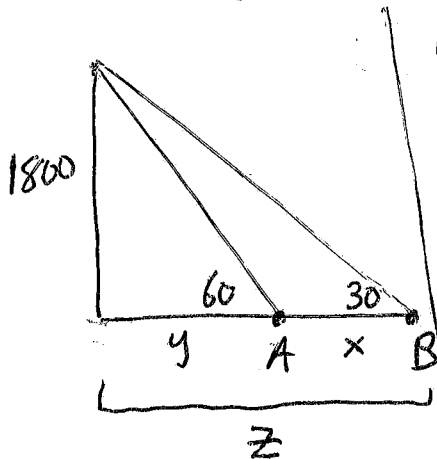
$$x = 2985.641 - 1715.606$$

$$x = 1270.035$$

ft.

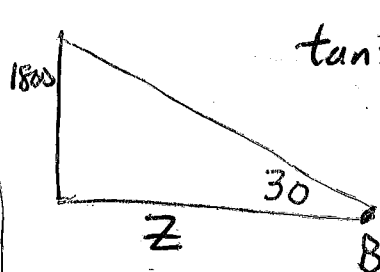
3)

An aeroplane at an altitude of 1800 m finds that two boats are sailing towards it in the same direction. The angles of depression of the boats as observed from the aeroplane are 60° and 30° respectively. Find the distance between the two boats. ($\sqrt{3} = 1.732$)



$$\tan 60 = \frac{1800}{y}$$

$$y = \frac{1800}{\tan 60} = \underline{\underline{1039.231}}$$



$$\tan 30 = \frac{1800}{z}$$

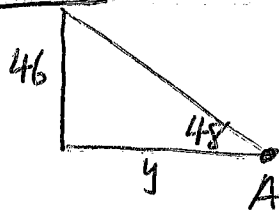
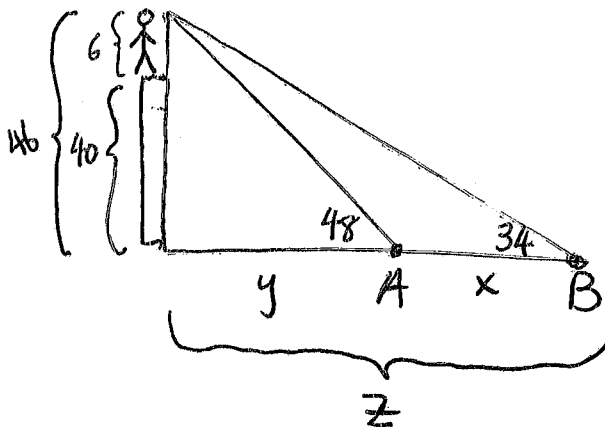
$$z = \frac{1800}{\tan 30} = \underline{\underline{3117.691}}$$

$$x = z - y$$

$$x = 3117.691 - 1039.231$$

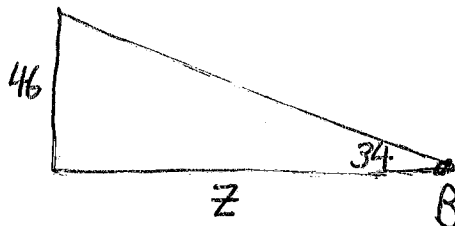
$$x = \underline{\underline{2078.46 \text{ meters}}}$$

4) Brad is standing on a 40-foot ocean bluff. He can see his two dogs on the beach below. If his line of sight is 6 feet above the ground and the angles of depression to his dogs are 34° and 48° , how far apart are the dogs to the nearest foot?



$$\tan 48 = \frac{46}{y}$$

$$y = \frac{46}{\tan 48} = \underline{\underline{41.419}}$$



$$\tan 34 = \frac{46}{z}$$

$$z = \frac{46}{\tan 34} = \underline{\underline{68.198}}$$

$$x = z - y$$

$$x = 68.198 - 41.419 = 26.779 \approx \underline{\underline{27 \text{ ft}}}$$