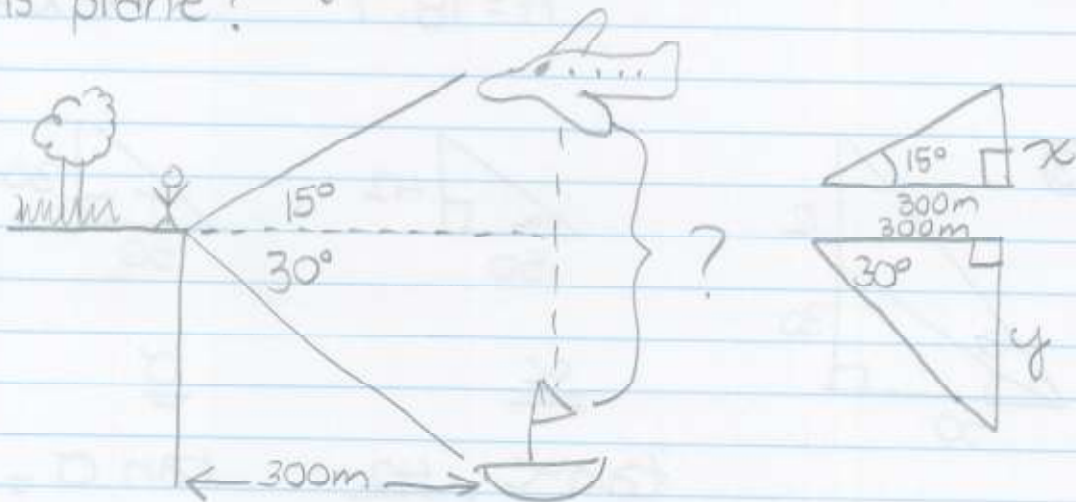


December 12th, 2007

Word Problems

- ① You are on a cliff and look at an angle of elevation of 15° to see a plane and an angle of depression of 30° to see a boat. The boat is directly below the plane. If boat is 300m away from bottom of cliff, how high is plane?



$$\tan 15 = \frac{x}{300}$$

$$x = 300 \cdot \tan 15$$

$$x = 80.4 \text{ m}$$

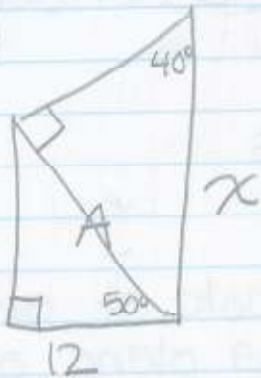
$$\tan 30 = \frac{y}{300}$$

$$y = 300 \cdot \tan 30$$

$$y = 173.2 \text{ m}$$

\therefore height of plane is 253.6m

②



Find x

$$\frac{A}{\cos 50} = \frac{12}{A}$$

$$\frac{x}{\sin 40} = \frac{18.7}{x}$$

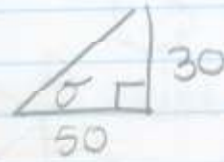
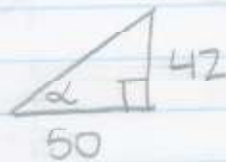
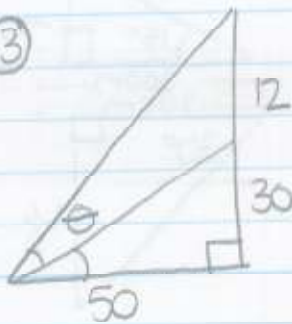
$$A = \frac{12}{\cos 50}$$

$$x = \frac{18.7}{\sin 40}$$

$$A = 18.7$$

$$\therefore x = 29.1$$

③



α

σ

$$\tan \alpha = \frac{42}{50}$$

$$\tan \sigma = \frac{30}{50}$$

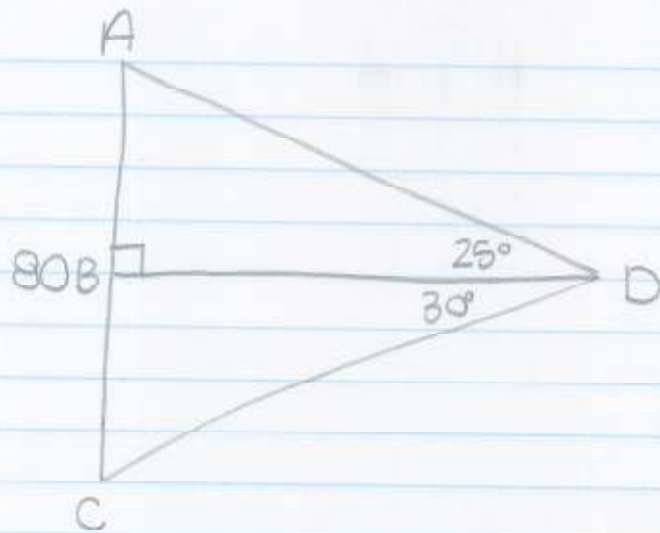
$$\alpha = 40$$

$$\sigma = 31^\circ$$

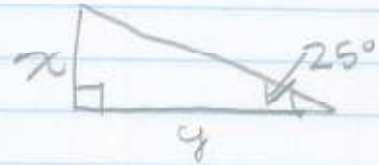
$$\therefore \theta = 40 - 31$$

$$\theta = 9^\circ$$

④



Find \overline{BD}



$$\textcircled{1} \tan 25 = \frac{x}{y}$$

$$\textcircled{2} \tan 30 = \frac{80-x}{y}$$

solve each for "x"

$$\textcircled{1} x = y \tan 25$$

$$\textcircled{2} 80-x = y \tan 30$$

$$80 - y \tan 30 = x$$

$$\begin{aligned} &\downarrow \\ y \tan 25 &= 80 - y \tan 30 \\ y \tan 25 + y \tan 30 &= 80 \\ y (\tan 25 + \tan 30) &= 80 \end{aligned}$$

$$y = \frac{80}{\tan 25 + \tan 30}$$

