Honors Math II   Name___Key_____

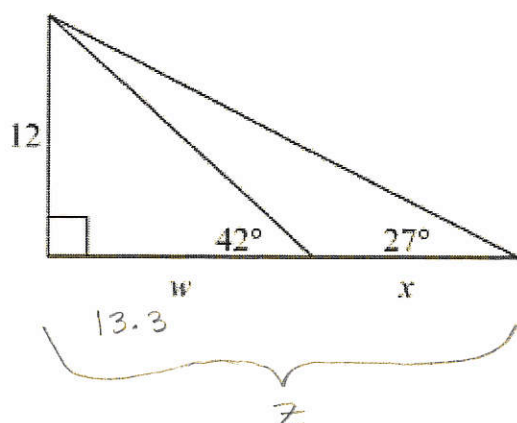   Period_____Date_____

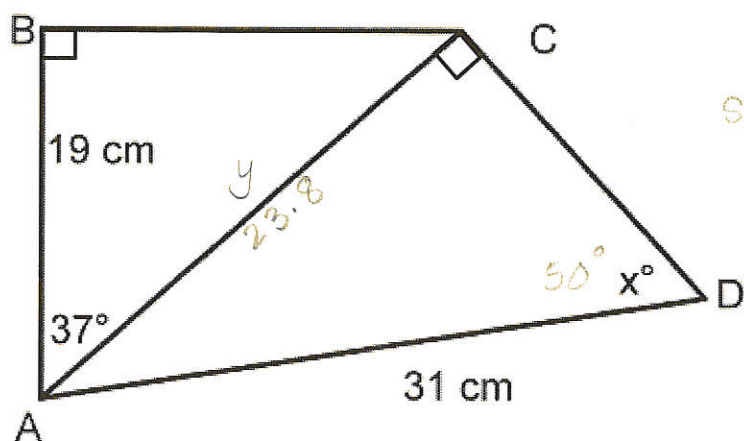1. Find the value of w, then x. Round lengths of segments to the nearest tenth.

$\tan 42° = \dfrac{12}{w}$ $w = \dfrac{12}{\tan 42°}$ $w = 13.3$

$\tan 27° = \dfrac{12}{z}$ $z = \dfrac{12}{\tan 27°}$ $z = 23.6$

$z - w = x$

$x = 10.3$

2. (a) Solve for $\angle CDA$
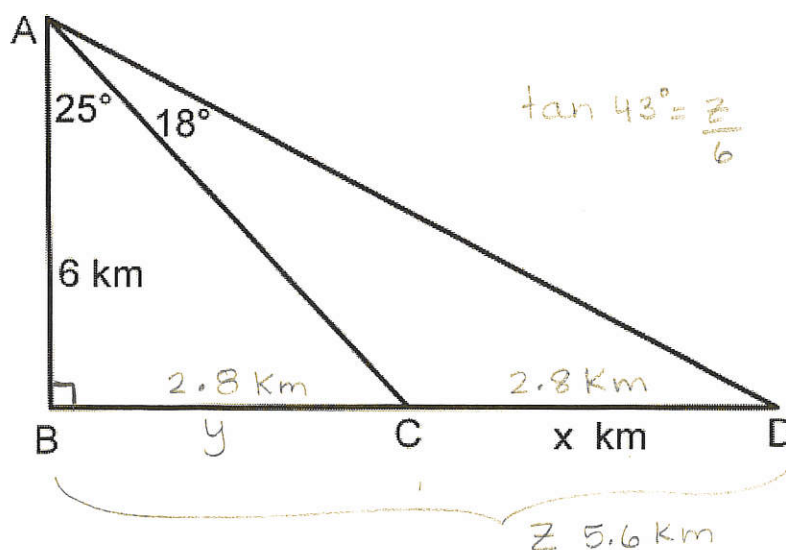
$\cos 37° = \dfrac{19}{y}$ $y = \dfrac{19}{\cos 37°} = 23.8$

$\sin x° = \dfrac{23.8}{31}$

$\sin^{-1}\left(\dfrac{23.8}{31}\right) = x°$

$x = 50°$

3. (b) Solve for side CD.

$\tan 25° = \dfrac{y}{6}$ $y = 6\tan 25°$

$y = 2.8 \text{ Km}$

$\tan 43° = \dfrac{z}{6}$ $6\tan 43° = z$

$z = 5.6 \text{ Km}$

$5.6 - 2.8 = 2.8 \text{ Km}$

$z \ 5.6 \text{ Km}$

4.

A police helicopter is flying above a road and between two racing cars driving on this road. The angle of depression to the lead car is 15° and the angle of depression to the trailing car is 40°. The direct distance from the police helicopter to the lead car is 200 m. (See the partial diagram included).

(T2,A2,K2,C2)

   a.   Determine the height/altitude of the helicopter.

   b.   Determine the distance between the two race cars.
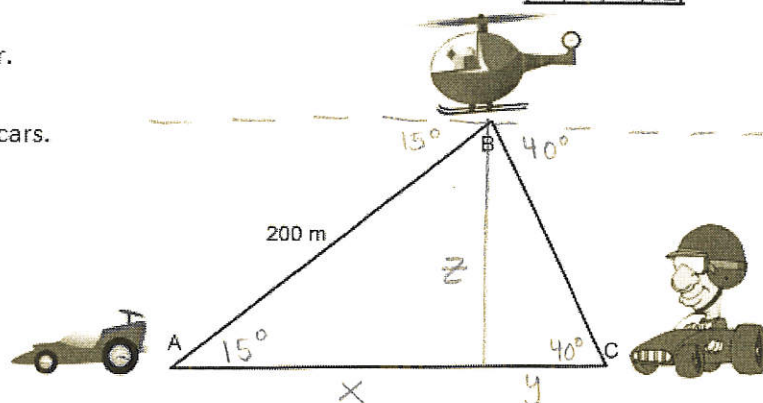
$$\sin 15° = \frac{z}{200}$$

$$200 \sin 15° = z$$

$$z = 51.8 \, m$$

$$\cos 15° = \frac{x}{200}$$

$$200 \cos 15° = x$$

$$x = 193.2 \, m$$

$$\tan 40° = \frac{51.8}{y}$$

$$y = \frac{51.8}{\tan 40°}$$

$$y = 61.7$$

$$193.2 + 61.7 = 254.9 \, m$$

5.

     Mr. Santowski is about to go rock climbing on the wall of a cliff. He wants to determine the height of the cliff, so from Point A, he observes the top of the cliff with an angle of elevation of 12°. He then moves directly forward 40 meters to Point B. From this new point, he notices the angle of elevation to now be 36°. Use this data to determine the height of the cliff. (T2,A2,K2)
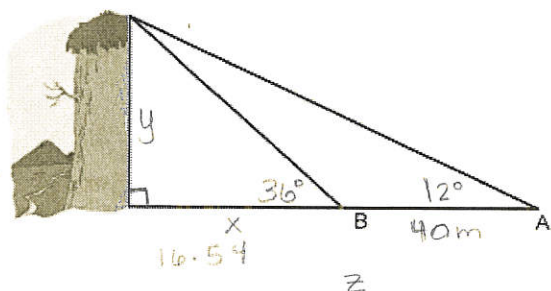
$$\tan 12° = \frac{y}{x+40}$$

$$\tan 36° = \frac{y}{x}$$

$$y = (x+40)\tan 12°$$

$$y = x \tan 36°$$

$$(x+40)\tan 12° = x \tan 36°$$

$$x \tan 12° + 40 \tan 12° = x \tan 36°$$

$$x(\tan 12° - \tan 36°) = -40 \tan 12°$$

$$x = \frac{-40 \tan 12°}{\tan 12° - \tan 36°}$$

$$x = 16.54 \, m$$

x = 16.54

z

$$y = 16.54 \tan 36°$$

$$y = 12 \, m$$