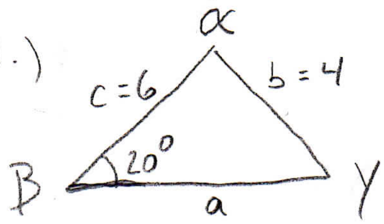
7.2 HW Solutions

31.)



$h = (L)\text{side} \cdot \sin(\text{given angle})$

$h = 6\sin 20 = \underline{2.05}$

- If I'm given a <u>SSA</u> scenario, I set my triangles up as:
  1. Angle goes bottom (L)
  2. 2 sides go on (L) + (R) sides of Δ
  3. Just keep in mind that the given side has to be placed across from it's corresponding angle.

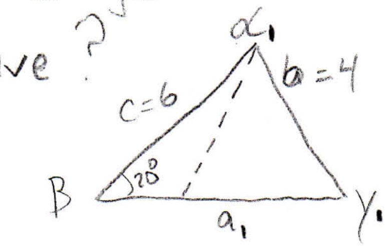
<u>How many triangles:</u>

- No Δ's: $h > (R)\text{side}$
- One Δ: $h = (R)\text{side}$ or $(R)\text{side} \geq (L)\text{side}$
- Two Δ's: $h < (R)\text{side} < (L)\text{side}$

* Since $h < (R)\text{side} < (L)\text{side}$
$2.05 < 4 < 6$, there are $\underline{2}$ possible triangles.

* To draw the 2^{ND} Δ, swing the (R) side over towards the (L) to create an obtuse ∠ for the bottom (R) angle

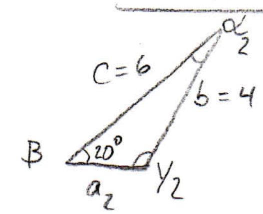
* What do we need to find in order to solve?



$\alpha_1 = \underline{129.14°}$, $\gamma_1 = \underline{30.86°}$, $a_1 = \underline{9.07}$

$\alpha_2 = \underline{10.86°}$, $\gamma_2 = \underline{149.14°}$, $a_2 = \underline{2.2}$

new triangle



(1) $\frac{\sin \gamma_1}{6} = \frac{\sin 20°}{4} \rightarrow \gamma_1 = \sin^{-1}\left[\frac{6\sin 20°}{4}\right] = \underline{30.86°}$

(2) $\alpha_1 = 180 - (20 + 30.86) = \underline{129.14°}$

(3) $\frac{\sin 129.14°}{a_1} = \frac{\sin 20°}{4} \rightarrow a_1 = \frac{4\sin 129.14°}{\sin 20°} = \underline{9.07}$

(4) To find the unknown bottom angle on the (R) side of the 2^{nd} Δ, take 180 − (whatever that bottom angle on the (R) side was in the 1^{st} Δ)

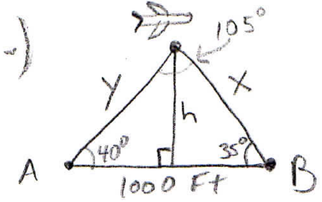
$\gamma_2 = 180 - \gamma_1 = 180 - 30.86 = \underline{149.14°}$

(5) $\alpha_2 = 180 - (149.14 + 20) = \underline{10.86°}$

(6) $\frac{\sin 10.86}{a_2} = \frac{\sin 20}{4} \rightarrow a_2 = \frac{4\sin 10.86}{\sin 20} = \underline{2.2}$

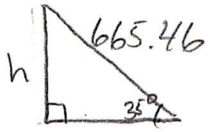
<over>

41.)



$$\frac{\sin 40^\circ}{x} = \frac{\sin 105^\circ}{1000}$$

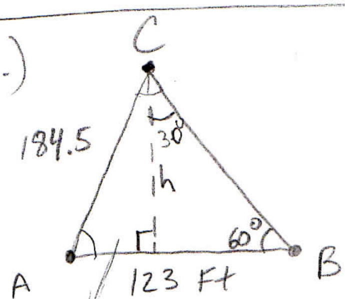
$$x = \frac{1000 \sin 40^\circ}{\sin 105^\circ} = \underline{665.46 \text{ Ft}}$$

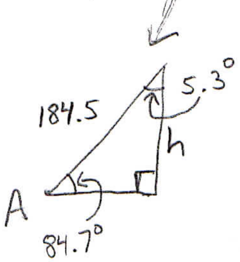


$$\sin 35^\circ = \frac{h}{665.46} \rightarrow h = 665.46 \sin 35^\circ$$

$$\boxed{h = 381.7 \text{ Ft}}$$

45.)





① $$\frac{\sin C}{123} = \frac{\sin 60^\circ}{184.5} \rightarrow C = \sin^{-1}\left[\frac{123 \sin 60^\circ}{184.5}\right]$$

$$\underline{C = 35.3^\circ}$$

② $35.3^\circ - 30^\circ = \underline{5.3^\circ}$

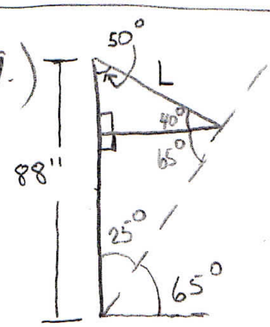
③ $\angle CAB = 90 - 5.3$

$$\boxed{\angle CAB = 84.7^\circ}$$

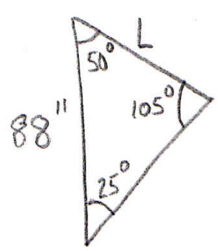
④ $$\sin 84.7^\circ = \frac{h}{184.5} \rightarrow h = 184.5 \sin 84.7 = \boxed{183.7 \text{ Ft}}$$

perpendicular distance from C to AB

49.)



$\Longrightarrow$



① $$\frac{\sin 25^\circ}{L} = \frac{\sin 105^\circ}{88}$$

$$L = \frac{88 \sin 25^\circ}{\sin 105^\circ} = \boxed{38.5''}$$