

Homework solutions
Section 2.5

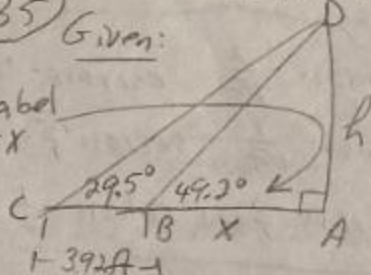
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Given:

FIND h :

Label
 $AB = x$



PLAN: Get an equation using
tangent in both triangles:
 $\triangle ABD$ and $\triangle ACD$

$$\text{So In } \triangle ABD \Rightarrow \tan(49.2^\circ) = \frac{h}{x} \Rightarrow h = x(\tan(49.2^\circ))$$

$$\text{In } \triangle ACD \Rightarrow \tan(29.5^\circ) = \frac{h}{x+392} \Rightarrow h = \tan(29.5^\circ)(x+392)$$

$\Rightarrow$ EQUATE THE RIGHT
SIDES OF THESE EQUATIONS

$$\Rightarrow x(\tan(49.2^\circ)) = \tan(29.5^\circ)(x+392)$$

APPROXIMATE:

$$x(1.159) = (.566)(x+392) \text{ solve this "as usual"}$$

$$\Rightarrow 1.159x = .566x + 221.872$$

$$\Rightarrow .593x = 221.872$$

$$\Rightarrow x = \frac{221.872}{.593}$$

$$= 374.152$$

Finally, use this to find h

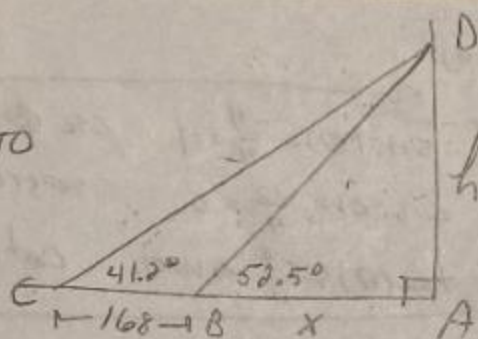
$$\Rightarrow h = (x)(\tan(49.2^\circ))$$

$$= (374.152)(\tan(49.2^\circ)) = \boxed{433.5}$$

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SIMILAR TO

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find h =

$$\text{In } \triangle DAB \Rightarrow \tan(52.5^\circ) = \frac{h}{x} \Rightarrow h = \tan(52.5^\circ)x$$

$$\text{In } \triangle DAC \Rightarrow \tan(41.2^\circ) = \frac{h}{x+168} \Rightarrow h = \tan(41.2^\circ)(x+168)$$

EQUATE

$$\Rightarrow \tan(52.5^\circ)x = \tan(41.2^\circ)(x+168)$$

$$\Rightarrow 1.303x = .875(x+168)$$

$$\Rightarrow 1.303x = .875x + 147$$

$$\Rightarrow .428x = 147$$

$$\Rightarrow x = 392.523 \Rightarrow h = \tan(52.5^\circ)(392.523)$$

$$= (1.303)(392.523)$$

$$= \boxed{511.5}$$