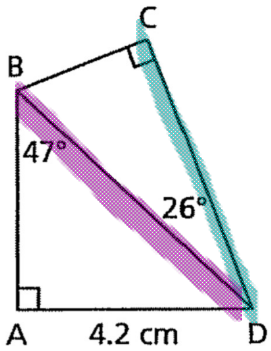
1.6 Solving Problems

Friday, February 10, 2023 2:43 PM

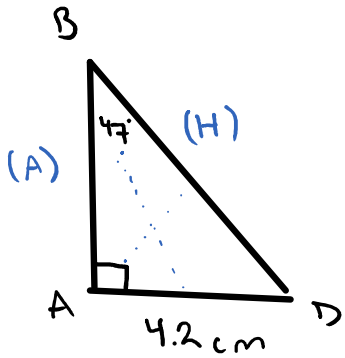
1.6 Solving Problems

EXAMPLE 1: Calculate the length of $\overline{CD}$ to the nearest tenth of a centimeter.



① Find $\overline{BD}$ using $\triangle ABD$

② Find $\overline{CD}$ using $\triangle BCD$



(O)

$$\sin\theta = \frac{O}{H}$$

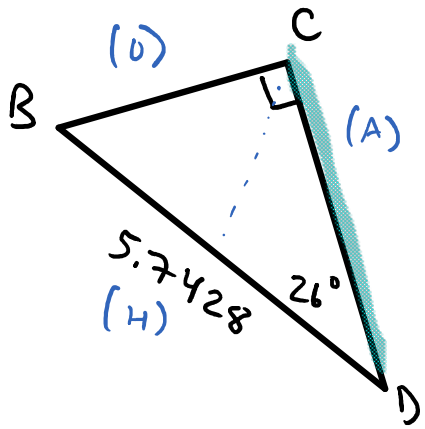
$$\overline{BD} \times \sin 47 = \frac{4.2}{\overline{BD}} \times \overline{BD}$$

$$\overline{BD}(\sin 47) = 4.2$$

$$\frac{\overline{BD}(\sin 47)}{\sin 47} = \frac{4.2}{\sin 47}$$

$$\overline{BD} = \frac{4.2}{\sin 47}$$

$$\overline{BD} = 5.7428$$



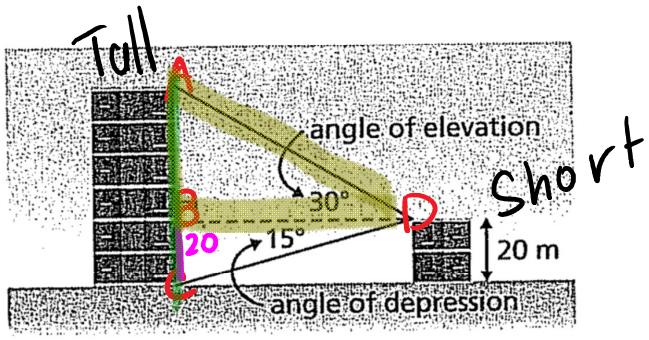
$$\cos\theta = \frac{A}{H}$$

$$5.7428 \times \cos 26 = \frac{\overline{CD}}{5.7428} \times 5.7428$$

$$5.7428(\cos 26) = \overline{CD}$$

$$\overline{CD} = 5.2 \text{ cm}$$

EXAMPLE 2: Determine the height of the taller building to the nearest tenth of a meter.

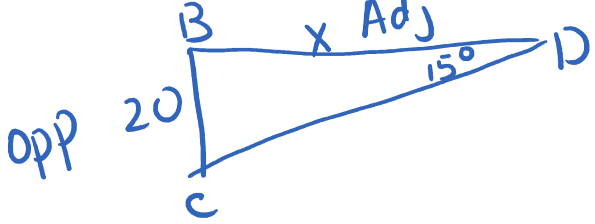


Find AC

AB + BC = AC

AB + 20 = AC

Find BD (shared side)



SOH CAH TOA

$\tan\theta = \frac{O}{A}$

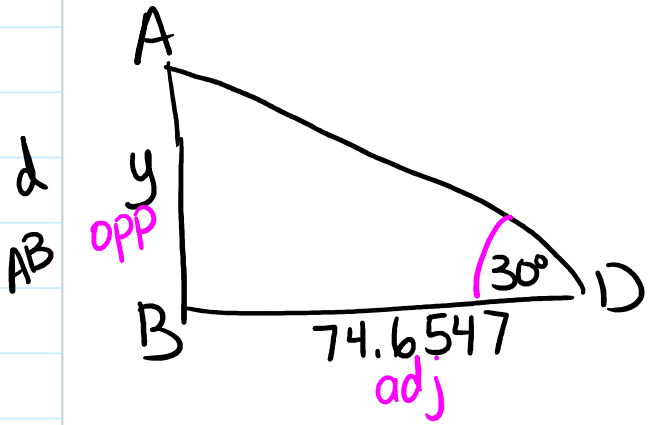
$x(\tan 15^\circ) = \left(\frac{20}{x}\right)x$

$\frac{x\tan 15^\circ}{\tan 15^\circ} = \frac{20}{\tan 15^\circ}$

$x = \frac{20}{\tan 15^\circ}$

$x = \frac{20}{.2679}$

$x = 74.6547$



$\tan\theta = \frac{O}{A}$

$74.6547(\tan 30^\circ) = \left(\frac{y}{74.6547}\right)74.6547$

$(74.6547)\tan 30^\circ = y$

$(74.6547)(.5774) = y$

$43.1056 = y$

Practice: p.118 #3a, 4a, 6 – 9, 11, 14, 19

$43.1056 = y$

Tall Building $= 43.1056 + 20$

$= 63.1056$

$= 63.1 \text{ m}$