

Trig Problem Solving

January 09, 18 10:16 AM

SOH CAH TOA

Ex. ① Kayla is a surveyor trying to determine the height of a tree. Her equipment is 1.8m tall, set up 52m from the bottom of the tree, and the angle of elevation is 12° . Find the tree's height.

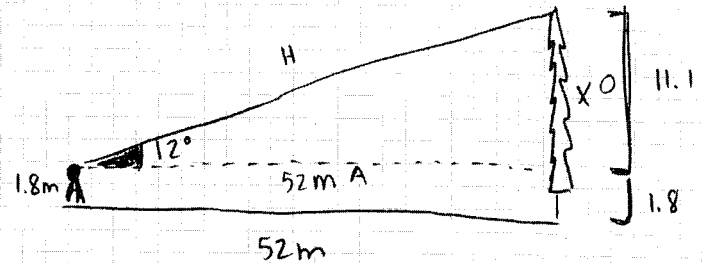
$$\tan \theta = \frac{O}{A}$$

$$52 \cdot \tan 12^\circ = \frac{x}{52}$$

$$52(0.2126) = x$$

$$11.1 \text{ m} = x$$

tree height : $11.1 \text{ m} + 1.8 \text{ m} = 12.9 \text{ m}$



* Common for real-life measurement: not from ground level.

↳ measured from Eve-level!

Ex. ② Solve for QR in the diagram below:

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Step ①

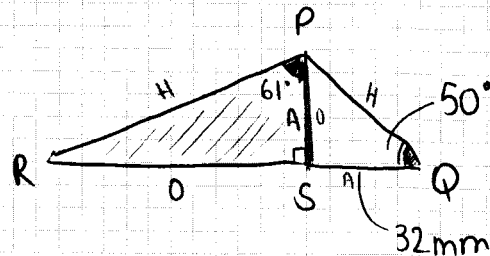
Use $\triangle PQS$, find \overline{PS}

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

$$32 \cdot \tan 50^\circ = \frac{PS}{32}$$

$$PS = 38.13 \dots \text{ mm}$$

keep an extra decimal place if it's an intermediate answer



Step ②

Use $\triangle PRS$ to find \overline{RS}

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

$$38.13 \tan 61^\circ = \frac{RS}{38.13}$$

$$RS = 68.79 \dots \text{ mm}$$

Step ③ : Add up! $QR = RS + SQ = 68.79 + 32 = 101 \text{ mm}$