

Distance Measurement

Class Problem #1

Determine the height of a flag pole. Assuming that the ground is level, a 150.0 ft. length is measured out from the base of the steeple and a 10°35' vertical angle is determined from that point on the ground to the top of the steeple.

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$$\tan(10.5833^\circ) = \frac{h}{150.0 \text{ ft.}} \Rightarrow h = 150.0 \times \tan(10.5833^\circ)$$

$h = 28.0266 \dots \text{ ft.}$
 $h = 28.03 \text{ ft.}$

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Class Problem #2

Determine the distance from your position to the base of a flag pole. Assuming that the ground is level, that the flag pole is 30.0 ft. tall, and that the vertical angle is 33°45' from your position.

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$$\tan(33.75^\circ) = \frac{30.0 \text{ ft.}}{d} \Rightarrow d = \frac{30.0 \text{ ft.}}{\tan(33.75^\circ)}$$

$d = 44.8982 \dots \text{ ft.}$
 $d = 44.9 \text{ ft.}$

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Class Problem #3

Determine the minimum length of a cable required to support the flag pole. Assuming that the ground is level, that the flag pole is 40.0 ft. tall, and that the supporting cable make a vertical angle of is 30° from your ground.

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$$\sin(30^\circ) = \frac{40.0 \text{ ft.}}{L} \Rightarrow L = \frac{40.0 \text{ ft.}}{\sin(30^\circ)}$$

$L = 80.0000 \text{ ft.}$
 $L = 80.0 \text{ ft.}$