

Geometry CC - Unit 8  
Lesson 8: Angle of Elevation/Depression  
M2 L29

HW Answers 8.7

①  $x \approx 7.3$                       ②  $x \approx 33.3$   
 ③  $x \approx 21.3$                     ④  $x \approx 31.9$   
 ⑤  $x \approx 25.6$                     ⑥  $x = 11.0$   
 ⑦  $x \approx 41.8^\circ$                 ⑧  $x \approx 64.2^\circ$   
 ⑨  $x \approx 12.8^\circ$                 ⑩  $x \approx 51.3^\circ$

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Main Ideas/Questions	Notes
<b>Angle of Elevation</b>	When looking UP to an object, the angle of elevation is formed by an observer's line of sight and a horizontal line.

**EXAMPLE:** Draw and label a diagram, then solve for the missing part. Round to the nearest tenth.

1. Casey sights the top of an 84 foot tall lighthouse at an angle of elevation of  $58^\circ$ . How far is he standing from the base of the lighthouse?

$$\tan 58 = \frac{84}{x}$$

$$x \tan 58 = \frac{84}{\tan 58}$$

$$x \approx 52.5 \text{ ft}$$

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$\angle$  of elevation =  $\angle$  of depression

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2. The angle of elevation from a kicker's foot on the football field to the top of the goal post bars is  $17^\circ$ . If he is standing 131 feet from the base of the goal post, how tall is the goal post?

$$\tan 17 = \frac{x}{131}$$

$$131 \tan 17 = x$$

$$x \approx 40.1 \text{ ft}$$

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6. A pilot in a helicopter spots a landing pad below. If the angle of depression is  $73^\circ$  and the horizontal distance to the pad is 1200 feet, what is the altitude of the helicopter?

$$\tan 73 = \frac{x}{1200}$$

$$1200 \tan 73 = x$$

$$x \approx 3,925.0 \text{ ft}$$

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8. Zack is standing at the top of a lookout tower and spots a water fountain below. If the lookout tower is 75 feet tall and the angle of depression is  $28^\circ$ , what is the horizontal distance between Zack and the water fountain?

$$\frac{\tan 28 = \frac{75}{x}}{1 \quad x}$$

$$\frac{x \tan 28 = 75}{\tan 28 \quad \tan 28}$$

$$x \approx 141.1 \text{ ft}$$

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**Angle of Elevation**  
 -The angle formed by an observer's line of sight up to an object and a line drawn horizontally from the observer.

**Angle of Depression**  
 -The angle formed by an observer's line of sight down to an object and a line drawn horizontally from the observer.

*This angle of depression is complementary to the angle you will use for calculations.*

**Vertical Drop**  
 -The difference in the elevation of the top and bottom of a slope.

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