

A.A.44: Using Trigonometry to Find a Side 3

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**A.A.44: Using Trigonometry to Find a Side 3: Find the measure of a side of a right triangle, given an acute angle and the length of another side**

- 1 The angle of elevation from a point 25 feet from the base of a tree on level ground to the top of the tree is  $30^\circ$ . Which equation can be used to find the height of the tree?
  - 1)  $\tan 30^\circ = \frac{x}{25}$
  - 2)  $\sin 30^\circ = \frac{x}{25}$
  - 3)  $\cos 30^\circ = \frac{x}{25}$
  - 4)  $30^2 + 25^2 = x^2$
- 2 In right triangle  $ABC$ ,  $m\angle C = 90$ ,  $a = 4$ , and  $\sin A = \frac{1}{2}$ . What is the length of the hypotenuse?
  - 1)  $4\sqrt{3}$
  - 2)  $\frac{8\sqrt{3}}{3}$
  - 3) 8
  - 4)  $8\sqrt{2}$
- 3 A 10-foot ladder is to be placed against the side of a building. The base of the ladder must be placed at an angle of  $72^\circ$  with the level ground for a secure footing. Find, to the *nearest inch*, how far the base of the ladder should be from the side of the building *and* how far up the side of the building the ladder will reach.
- 4 Draw and label a diagram of the path of an airplane climbing at an angle of  $11^\circ$  with the ground. Find, to the *nearest foot*, the ground distance the airplane has traveled when it has attained an altitude of 400 feet.
- 5 A tree casts a shadow that is 20 feet long. The angle of elevation from the end of the shadow to the top of the tree is  $66^\circ$ . Determine the height of the tree, to the *nearest foot*.
- 6 A person measures the angle of depression from the top of a wall to a point on the ground. The point is located on level ground 62 feet from the base of the wall and the angle of depression is  $52^\circ$ . How high is the wall, to the nearest tenth of a foot?
- 7 A ship on the ocean surface detects a sunken ship on the ocean floor at an angle of depression of  $50^\circ$ . The distance between the ship on the surface and the sunken ship on the ocean floor is 200 meters. If the ocean floor is level in this area, how far above the ocean floor, to the *nearest meter*, is the ship on the surface?
- 8 At Mogul's Ski Resort, the beginner's slope is inclined at an angle of  $12.3^\circ$ , while the advanced slope is inclined at an angle of  $26.4^\circ$ . If Rudy skis 1,000 meters down the advanced slope while Valerie skis the same distance on the beginner's slope, how much longer was the horizontal distance that Valerie covered?
  - 1) 81.3 m
  - 2) 231.6 m
  - 3) 895.7 m
  - 4) 977.0 m

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## **Answer Section**

1 ANS: 1 REF: 060419a

2 ANS: 3 REF: 088725siii


3 ANS:

$$114'' \text{ and } 37''. \quad \cos 72 = \frac{\text{adjacent}}{10} \quad \sin 72 = \frac{\text{opposite}}{10}$$

$$\text{adjacent} \approx 3.1 \text{ feet} \approx 37 \text{ inches} \quad \text{opposite} \approx 9.5 \text{ feet} \approx 114 \text{ inches}$$

REF: 080033a

4 ANS:



$$\tan 11 = \frac{400}{\text{adjacent}}$$

$$\text{adjacent} \approx 2058$$

REF: 010235a

5 ANS:

$$45. \quad \tan 66 = \frac{\text{opposite}}{20}$$

$$\text{opposite} \approx 45$$

REF: 080536a

6 ANS:

$$79.4. \quad \tan 52 = \frac{\text{opposite}}{62}$$

$$\text{opposite} \approx 79.4$$

REF: 060639a

7 ANS:

$$153. \quad \sin 50 = \frac{\text{opposite}}{200}$$

$$\text{opposite} \approx 153$$

REF: 080133a

8 ANS: 1

$$\cos 12.3 = \frac{\text{adjacent}}{1000} \quad \cos 26.4 = \frac{\text{adjacent}}{1000} \quad 977 - 895.7 = 81.3$$

$$\text{adjacent} \approx 977 \text{ feet} \quad \text{adjacent} \approx 895.7 \text{ feet}$$

REF: 080108b