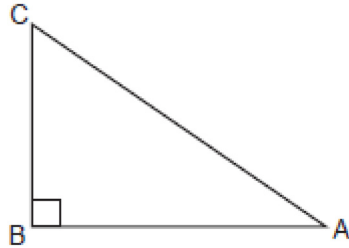


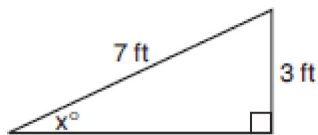
A.A.43: Using Trigonometry to Find an Angle 2: Determine the measure of an angle of a right triangle, given the length of any two sides of the triangle

- 1 Cassandra is calculating the measure of angle A in right triangle ABC , as shown in the accompanying diagram. She knows the lengths of \overline{AB} and \overline{BC} ,

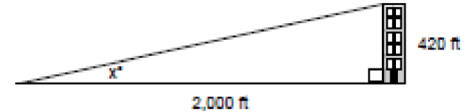


If she finds the measure of angle A by solving only one equation, which concept will be used in her calculations?

- 1) Pythagorean theorem
 - 2) $\sin A$
 - 3) $\cos A$
 - 4) $\tan A$
- 2 Ron and Francine are building a ramp for performing skateboard stunts, as shown in the accompanying diagram. The ramp is 7 feet long and 3 feet high. What is the measure of the angle, x , that the ramp makes with the ground, to the nearest tenth of a degree?

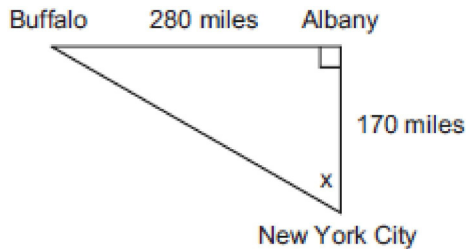


- 3 A person standing on level ground is 2,000 feet away from the foot of a 420-foot-tall building, as shown in the accompanying diagram. To the nearest degree, what is the value of x ?



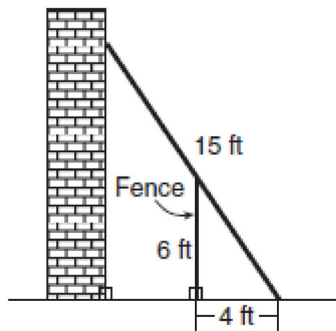
- 4 If a tree 28 meters tall casts a shadow 32 meters long, what is the angle of elevation of the Sun to the nearest degree?
- 1) 29
 - 2) 41
 - 3) 50
 - 4) 61

- 5 As seen in the accompanying diagram, a person can travel from New York City to Buffalo by going north 170 miles to Albany and then west 280 miles to Buffalo.



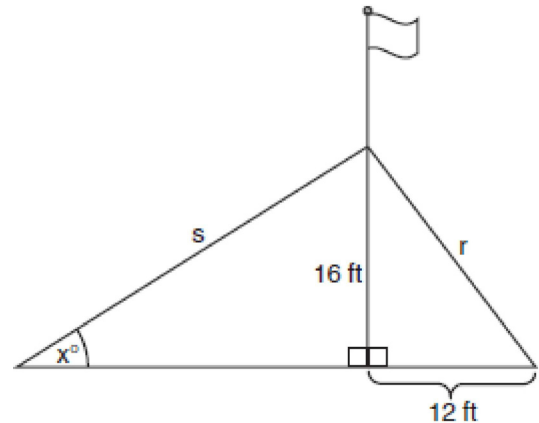
If an engineer wants to design a highway to connect New York City directly to Buffalo, at what angle, x , would she need to build the highway? Find the angle to the *nearest degree*. To the *nearest mile*, how many miles would be saved by traveling directly from New York City to Buffalo rather than by traveling first to Albany and then to Buffalo?

- 6 In the accompanying diagram, the base of a 15-foot ladder rests on the ground 4 feet from a 6-foot fence.



- a* If the ladder touches the top of the fence and the side of a building, what angle, to the *nearest degree*, does the ladder make with the ground?
- b* Using the angle found in part *a*, determine how far the top of the ladder reaches up the side of the building, to the *nearest foot*.

- 7 The accompanying diagram shows a flagpole that stands on level ground. Two cables, r and s , are attached to the pole at a point 16 feet above the ground. The combined length of the two cables is 50 feet. If cable r is attached to the ground 12 feet from the base of the pole, what is the measure of the angle, x , to the *nearest degree*, that cable s makes with the ground?



A.A.43: Using Trigonometry to Find an Angle 2: Determine the measure of an angle of a right triangle, given the length of any two sides of the triangle
Answer Section

1 ANS: 4 PTS: 2 REF: 060820a

2 ANS:

$$25.4. \quad \sin x = \frac{3}{7}$$

$$x \approx 25.4$$

PTS: 2 REF: 060735a

3 ANS:

$$12. \quad \tan x = \frac{420}{2000}$$

$$x \approx 12$$

PTS: 3 REF: 089927a

4 ANS: 2 PTS: 2 REF: 068533siii

5 ANS:

$$59, 122. \quad \tan x = \frac{280}{170} \quad a^2 + b^2 = c^2 \quad 170^2 + 280^2 = c^2 \quad . \quad \text{The trip from New York City to Buffalo via Albany is } 450 \text{ (} 280 + 170 \text{) miles. Therefore traveling directly to Buffalo would save } (450 - 328) \text{ 122 miles.}$$

$$x \approx 59 \quad c \approx 328$$

PTS: 4 REF: 060231a

6 ANS:

$$56, 12. \quad \tan x = \frac{6}{4} \quad \sin 56 = \frac{\text{opposite}}{15}$$

$$x \approx 56 \quad \text{opposite} \approx 12$$

PTS: 4 REF: 010438a

7 ANS:

$$a^2 + b^2 = c^2$$

$$32. \quad 12^2 + 16^2 = c^2 \quad . \quad \text{If the combined length of the two cables is 50 feet, then } s \text{ is } 30 \text{ (} 50 - 20 \text{) feet.}$$

$$c = 20 \quad \sin x = \frac{16}{30}$$

$$x \approx 32$$

PTS: 4 REF: 060539a