Question

The angle of elevation to the top of a 30-story skyscraper is measured to be 4° from a point on the ground 2,500 feet from the building. What is the height of the skyscraper to the nearest hundredth foot?

A: 174.82 feet

B: 174.39 feet

C: 83.13 feet

D: 96.49 feet

Solution

We have a right triangle, where

b is the height of the skyscraper, a = 2,500 feet and A = $4°$. Then b/a=tan A; b=a tan A ;

b = 2.500*tan $4°$ ≈ 174.82

Answer: A.

Question

A 50-foot tree casts a shadow 9 feet long. The sine of the angle of elevation of the top of the tree to the sun is approximately

A: 0.01

B: 0.18

C: 0.02

D: 0.98

Solution

We have a right triangle,

b=50 feet, a=9 feet, then by Pythagorean Theorem, c=$\sqrt{2500 + 81}$ ≈ 50.80354. We have to find sin B = a/c; sin B= 9/50.80354≈0.18.

Answer: B. 0.18

Question

Which of the following triangles are right triangles? Check all that apply.

A triangle with side lengths 6 inches, 8 inches, 10 inches,

A triangle with side lengths 5, 12, 13

A triangle with side lengths 9, 12, 15

A triangle with side lengths 8, 15, 17

Solution

Using the Pythagorean theorem, $a^2 + b^2 = c^2$, check

$\sqrt{6^2 + 8^2} = \sqrt{36 + 64} = \sqrt{100} = 10$;

$\sqrt{5^2 + 12^2} = \sqrt{25 + 144} = \sqrt{169} = 13$;

$$\sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = 15;$$
$$\sqrt{8^2 + 15^2} = \sqrt{64 + 225} = \sqrt{289} = 17.$$

Answer: All these triangles are right.