

Right Triangle Word Problems Answers and Explanations

1. B

This is a simple Pythagorean triangle problem where we must solve for the length of the hypotenuse.

$$\begin{aligned}20^2 + 5^2 &= c^2 \\425 &= c^2 \\\sqrt{425} &= c\end{aligned}$$

Now we simplify our answer to get $5\sqrt{17}$

2. B

The 2-dimensional section of the cone is a right triangle. This means we can find the slant length using the Pythagorean theorem. Notice that the leg lengths of the triangle correspond with the ratio of a 3-4-5 triangle. This means that the hypotenuse will be 10 inches as the ratio is doubled.

3. C

If the platform is 8 feet tall, the height of the right triangle is also 8 feet tall. We can use the Pythagorean formula to find out the remaining side's length.

$$\begin{aligned}8^2 + b^2 &= 17^2 \\64 + b^2 &= 289 \\b^2 &= 225 \\b &= 15 \text{ ft}\end{aligned}$$

4. A

An equilateral triangle that is bisected will create two 30-60-90 triangles. With this information we can find the height of the triangle as well as the height of the bridge. If the sides of the equilateral triangles are 8 feet, then the hypotenuse of our 30-60-90 triangle will also be 8 feet in length. The properties of a 30-60-90 triangle state that the hypotenuse is equal to $2x$ while the legs are equal to x and $x\sqrt{3}$. This means $x = 4$ and the height of the triangle would be $4\sqrt{3}$

5. D

Using the diagram given to us, we can use the Pythagorean theorem to determine the length between the Tower and airport.

$$\begin{aligned}150^2 + b^2 &= 250^2 \\22500 + b^2 &= 62500 \\b^2 &= 40000 \\b &= 200 \text{ miles}\end{aligned}$$

6. C

Right Triangle Word Problems Answers and Explanations

If a square napkin is folded in half diagonally, the triangle created will be an isosceles 45-45-90 triangle. To find the leg lengths of this triangle, we must first determine how long the sides of the square are. The perimeter of the square is 28 inches, meaning that each side would have to be 7 inches. This means that the triangle's legs would also be 7 and the hypotenuse would be $7\sqrt{2}$. If we add the three sides we get $14 + 7\sqrt{2}$.

7. B

To find the diagonal, we must use the Pythagorean theorem.

$$\begin{aligned}45^2 + 25^2 &= c^2 \\2025 + 625 &= c^2 \\51.5 &\approx c\end{aligned}$$

8. A

Notice that this right triangle has the ratio of a 3-4-5 triangle. This means that the hypotenuse, or the drive up the hill will be 500 ft.

9. B

Use the Pythagorean theorem to solve for the hypotenuse which is the longest side of the triangle.

$$\begin{aligned}2^2 + 4.5^2 &= c^2 \\4 + 20.25 &= c^2 \\4.92 \text{ in} &= c\end{aligned}$$

10. C

The isosceles triangle shown above is a 45-45-90 triangle, meaning that the hypotenuse, or the distance between the boomerang points will be $8\sqrt{2}$ inches.