

Tangent Lines - Guided Lesson Explanation

Explanation#1

Step 1) First we have to see what is being asked.

“What is XZ?”

Step 2) Since \overline{YZ} is tangent to $\odot X$, \overline{YZ} is perpendicular to \overline{XY} . So $\triangle XYZ$ is a right triangle with hypotenuse \overline{XZ} .

Now use the Pythagorean Theorem to find XZ.

$$XY^2 + YZ^2 = XZ^2$$

$$6^2 + 3.2^2 = XZ^2 \quad \text{Plug in } XY = 6 \text{ and } YZ = 3.2$$

$$36 + 10.24 = XZ^2 \quad \text{Square}$$

$$46.24 = XZ^2 \quad \text{Add}$$

$$6.8 = XZ \quad \text{Take the square root of both sides}$$

Step 3) So the answer is $XZ = 6.8$ inch.

Explanation#2

Step 1) First we have to see what is being asked.

“What is AC?”

Step 2) Since \overline{BC} is tangent to $\odot A$, \overline{BC} is perpendicular to \overline{AB} . So $\triangle ABC$ is a right triangle with hypotenuse \overline{AC} .

Now use the Pythagorean Theorem to find AC.

$$AB^2 + BC^2 = AC^2$$

$$4^2 + 8^2 = AC^2 \quad \text{Plug in } AB = 4 \text{ and } BC = 8$$

$$16 + 64 = AC^2 \quad \text{Square}$$

$$80 = AC^2 \quad \text{Add}$$

$$8.9 = AC \quad \text{Take the square root of both sides}$$

Step 3) So the answer is $AC = 8.9$ inch.



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Explanation#3

Step 1) First we have to see what is being asked.

"What is EG?"

Step 2) Since \overline{FG} is tangent to $\odot E$, \overline{FG} is perpendicular to \overline{EF} . So $\triangle EFG$ is a right triangle with hypotenuse \overline{EG} .

Now use the Pythagorean Theorem to find EG.

$$EF^2 + FG^2 = EG^2$$

$$1.8^2 + 7^2 = EG^2 \quad \text{Plug in } EF = 1.8 \text{ and } FG = 7$$

$$3.24 + 49 = EG^2 \quad \text{Square}$$

$$52.24 = EG^2 \quad \text{Add}$$

$$7.2 = EG \quad \text{Take the square root of both sides}$$

Step 3) So the answer is $EG = 7.2$ inch.

