

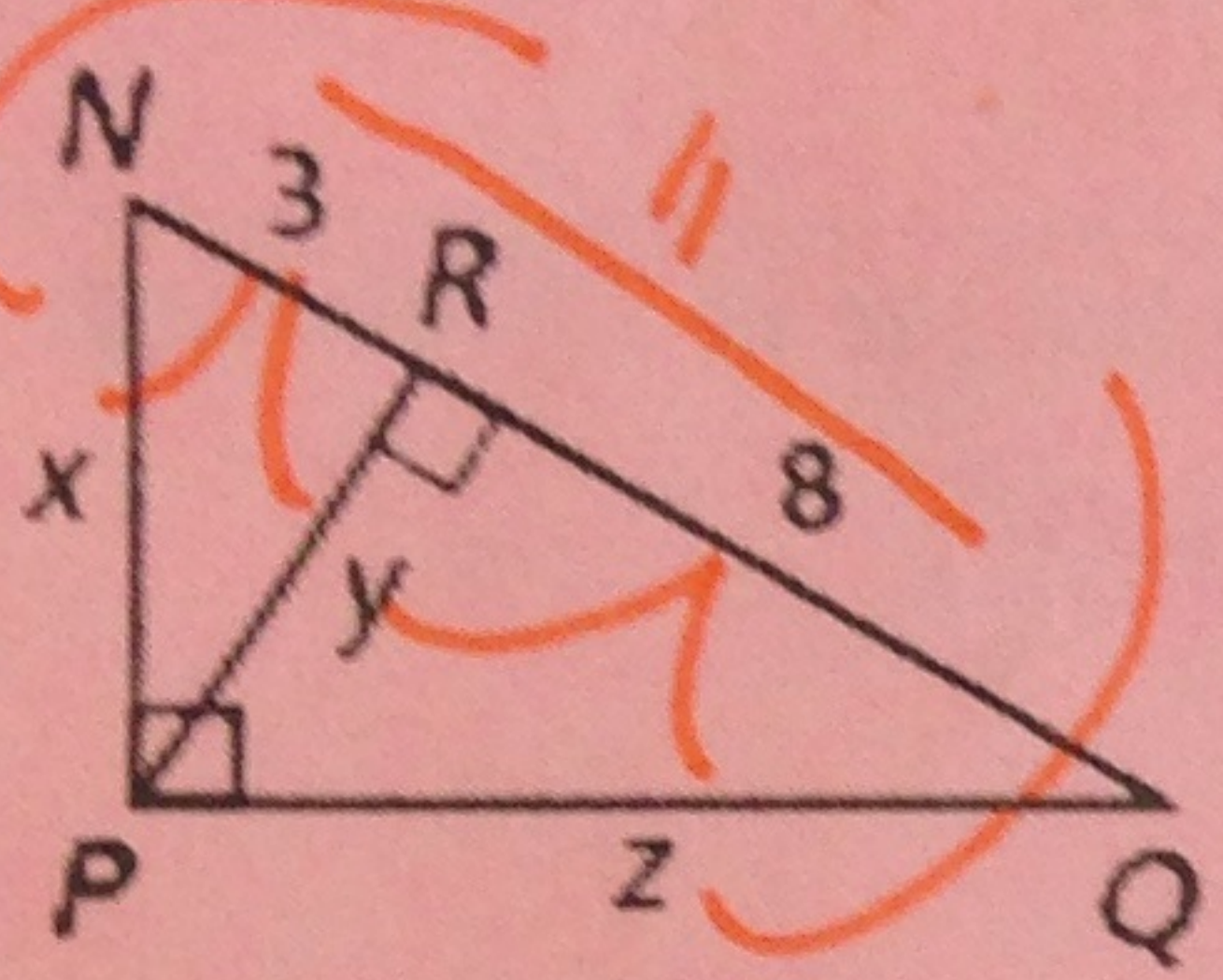
SHOW WORK.

#1- 11: Give exact answers in simplest form—no decimals.

1. Find the geometric mean between 32 and 3.

$$\begin{aligned}
 &= \sqrt{32(3)} \\
 &= \sqrt{96} \\
 &= 4\sqrt{6}
 \end{aligned}$$

2. Find x , y , and z .

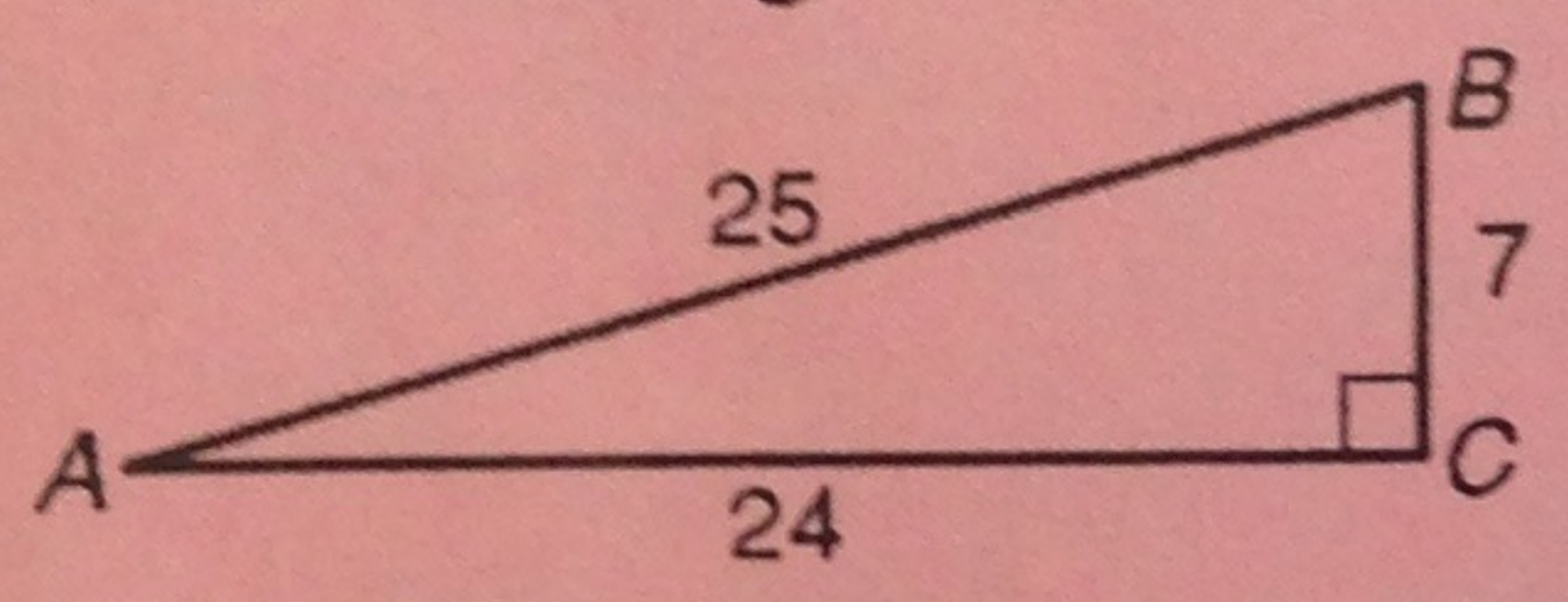


$$\begin{aligned}
 x^2 &= 3(11) \\
 x^2 &= 33 \\
 x &= \sqrt{33}
 \end{aligned}$$

$$\begin{aligned}
 y^2 &= (3)(8) \\
 y^2 &= 24 \\
 y &= 2\sqrt{6}
 \end{aligned}$$

$$\begin{aligned}
 z^2 &= (8)(11) \\
 z^2 &= \sqrt{88} \\
 z &= 2\sqrt{22}
 \end{aligned}$$

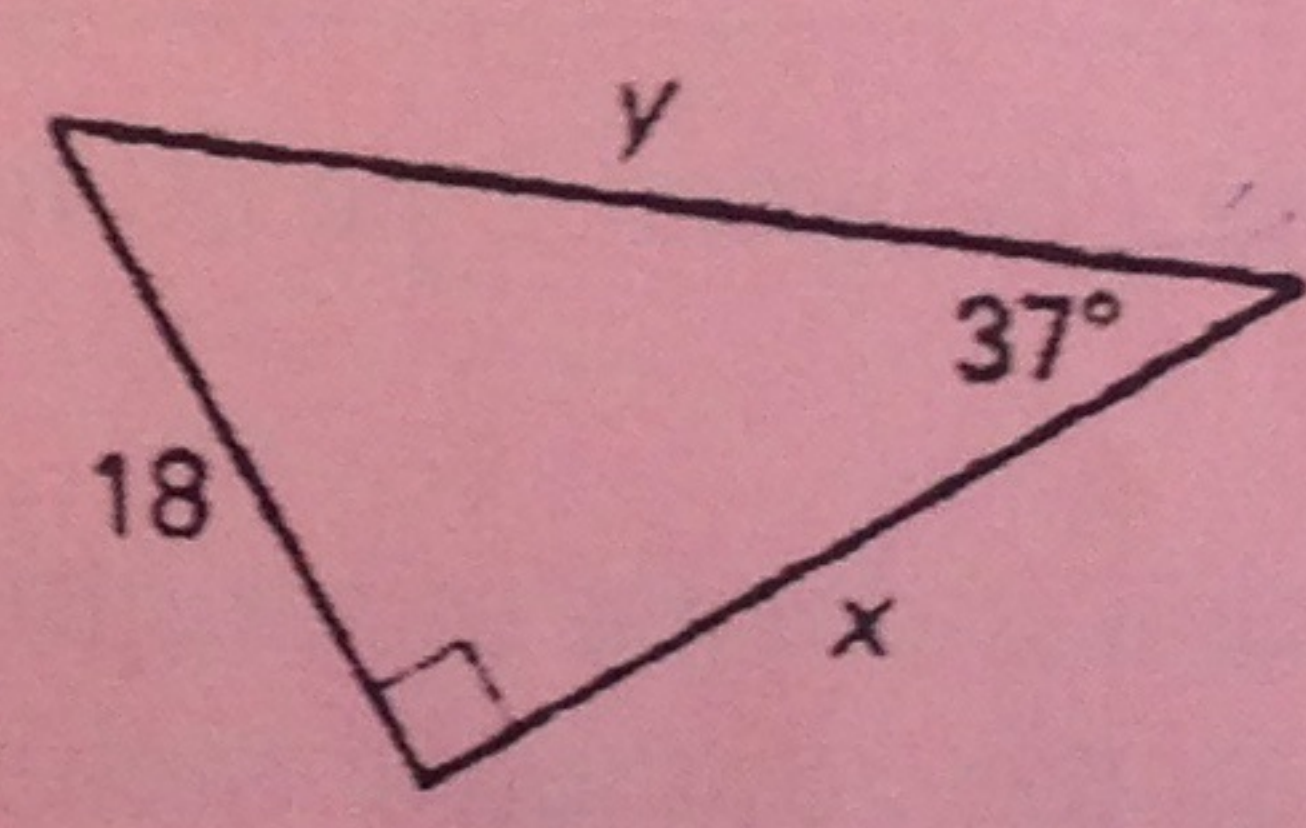
3. Write each trigonometric ratio as a fraction.



a. $\sin B = \frac{24}{25}$ b. $\cos B = \frac{7}{25}$

c. $\tan B = \frac{24}{7}$

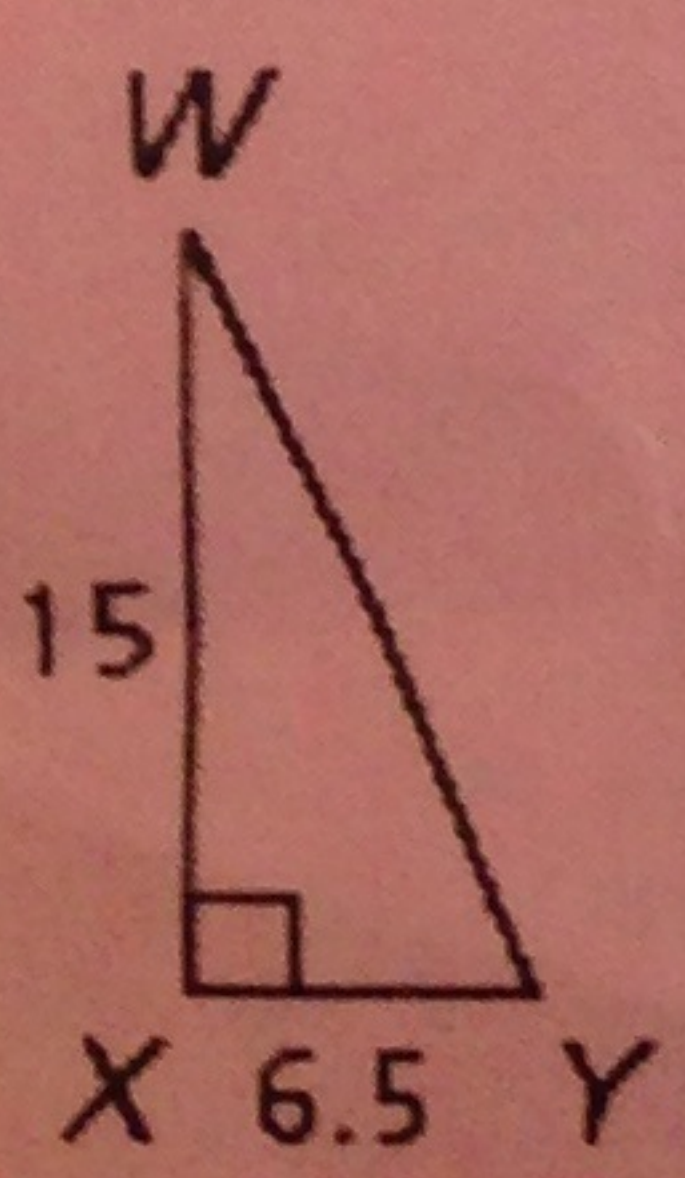
4. Find x and y . Round to the nearest tenth.



$$\begin{aligned}
 \tan 37 &= \frac{18}{x} \\
 x \cdot \tan 37 &= 18 \\
 x &= \frac{18}{\tan 37} = 23.9
 \end{aligned}$$

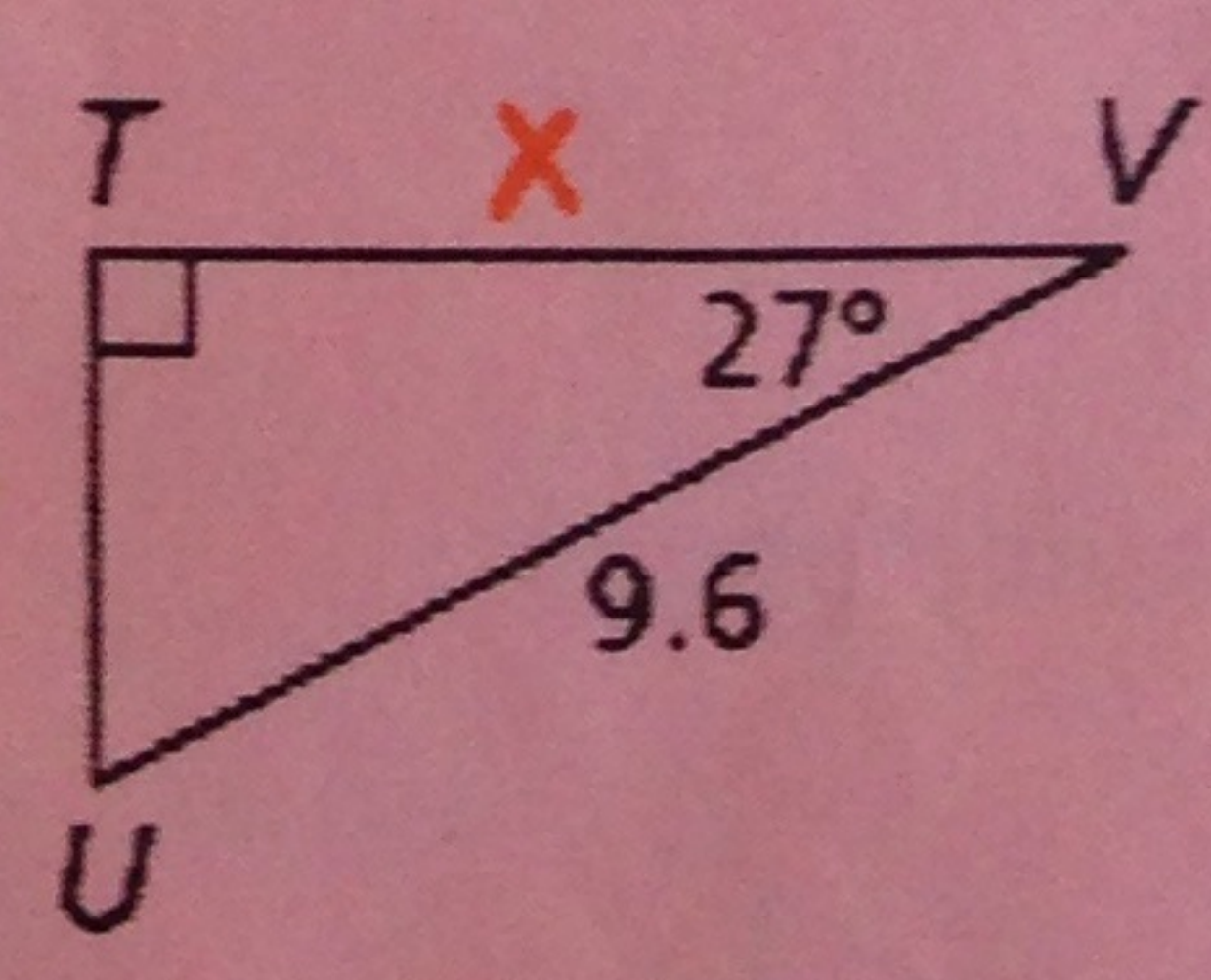
$$\begin{aligned}
 \sin 37 &= \frac{18}{y} \\
 y \sin 37 &= 18 \\
 y &= \frac{18}{\sin 37} = 29.9
 \end{aligned}$$

5. Find $m\angle Y$. Round to the nearest degree.



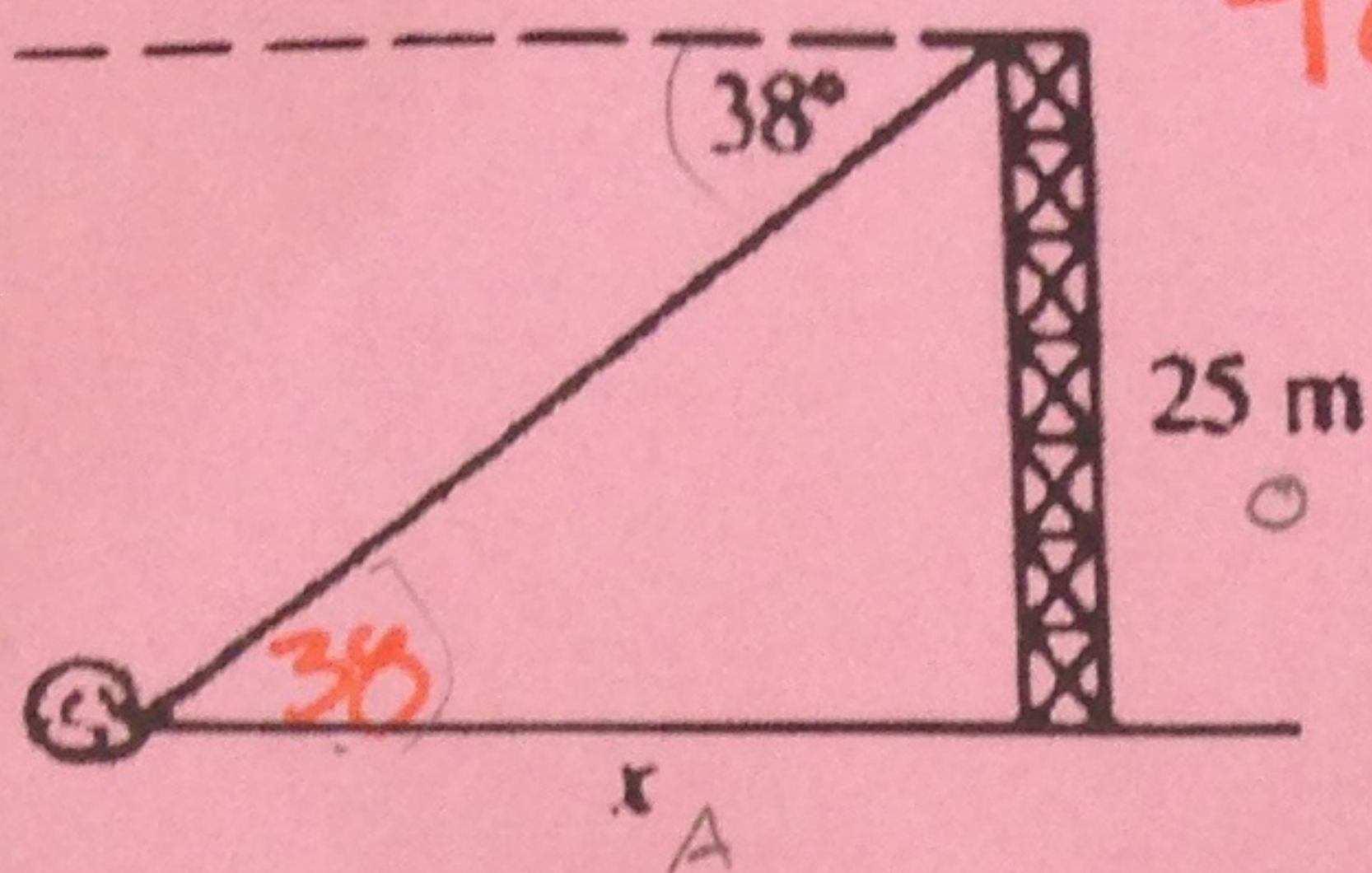
$$\begin{aligned}
 \tan Y &= \frac{15}{6.5} \\
 Y &= \tan^{-1}\left(\frac{15}{6.5}\right) \\
 Y &= 67^\circ
 \end{aligned}$$

6. Find TU . Round to the nearest tenth.



$$\begin{aligned}
 \cos 27 &= \frac{x}{9.6} \\
 x &= 9.6 \cdot \cos 27 \\
 x &= 8.6
 \end{aligned}$$

7. The angle of depression from the top of a tower to a boulder on the ground is 38° . If the tower is 25 meters high, what is the horizontal distance from the base of the tower to the boulder? Round to the nearest tenth of a meter.



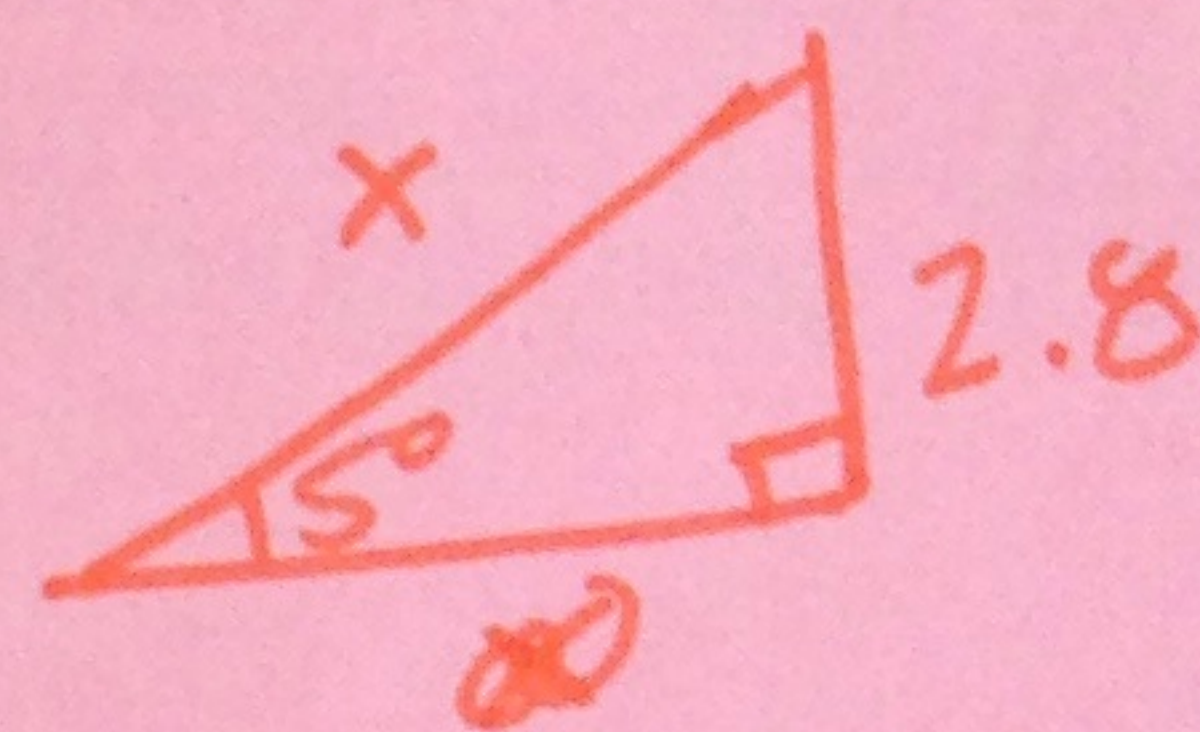
$$\tan 38 = \frac{25}{x}$$

$$x \cdot \tan 38 = 25$$

$$x = \frac{25}{\tan 38}$$

$$x = 32 \text{ m}$$

8. Jesse is building a ramp for loading motorcycles into a trailer. The trailer is 2.8 ft off the ground. The angle of elevation between the ramp and the ground is 15° . To the nearest tenth of a foot, how long is the ramp?

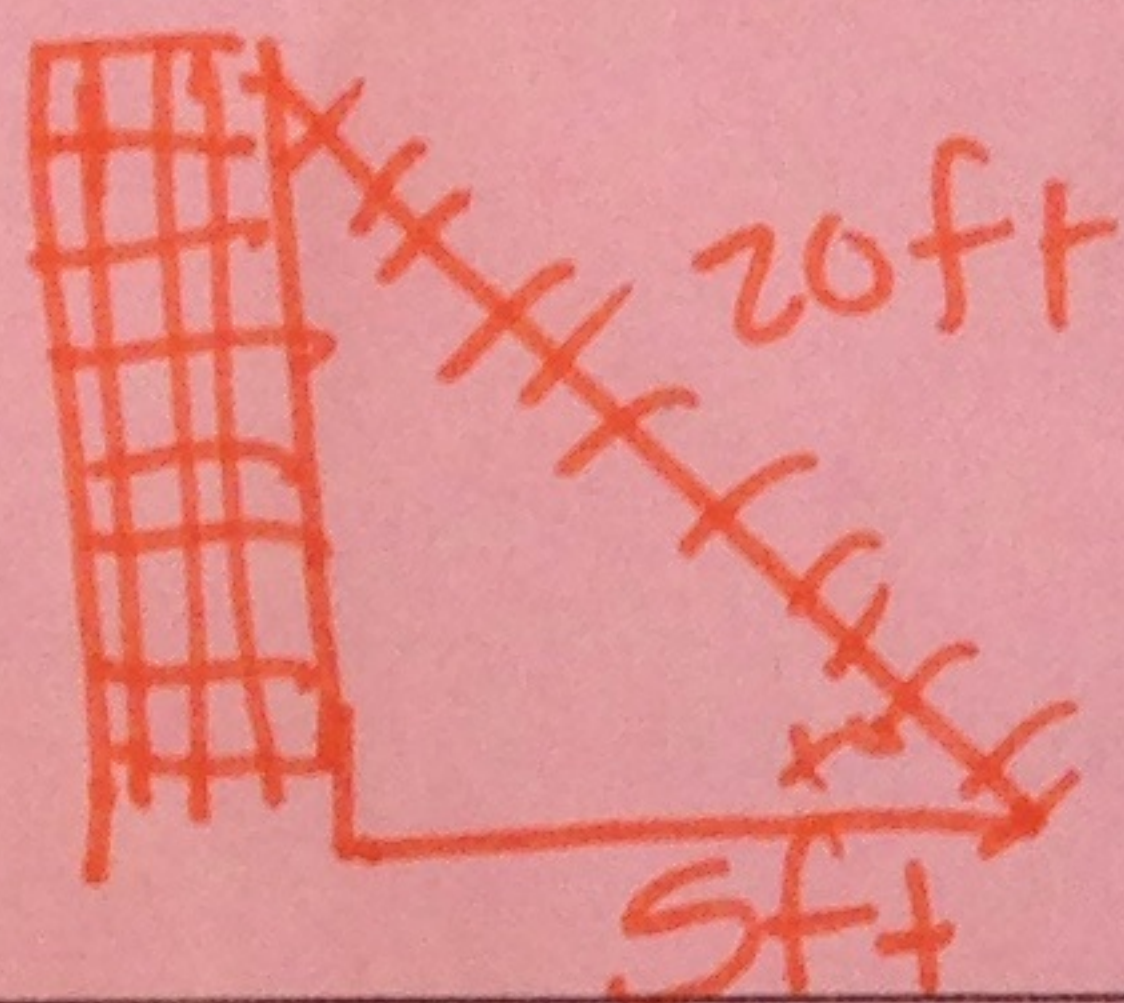


$$\sin 15 = \frac{2.8}{x}$$

$$x \cdot \sin 15 = 2.8$$

$$x = \frac{2.8}{\sin 15} = 10.8 \text{ ft}$$

9. The top of a 20-foot ladder leans against the side of a building. If the base of the ladder is 5 feet from the wall, what is the measure of the angle formed by the ladder and the ground? Round to the nearest degree.



$$\cos x = \frac{5}{20}$$

$$x = \cos^{-1}\left(\frac{5}{20}\right)$$

$$x = 76^\circ$$

If a number x is the geometric mean between 2 positive numbers a and b , then $\frac{a}{x} = \frac{x}{b}$.

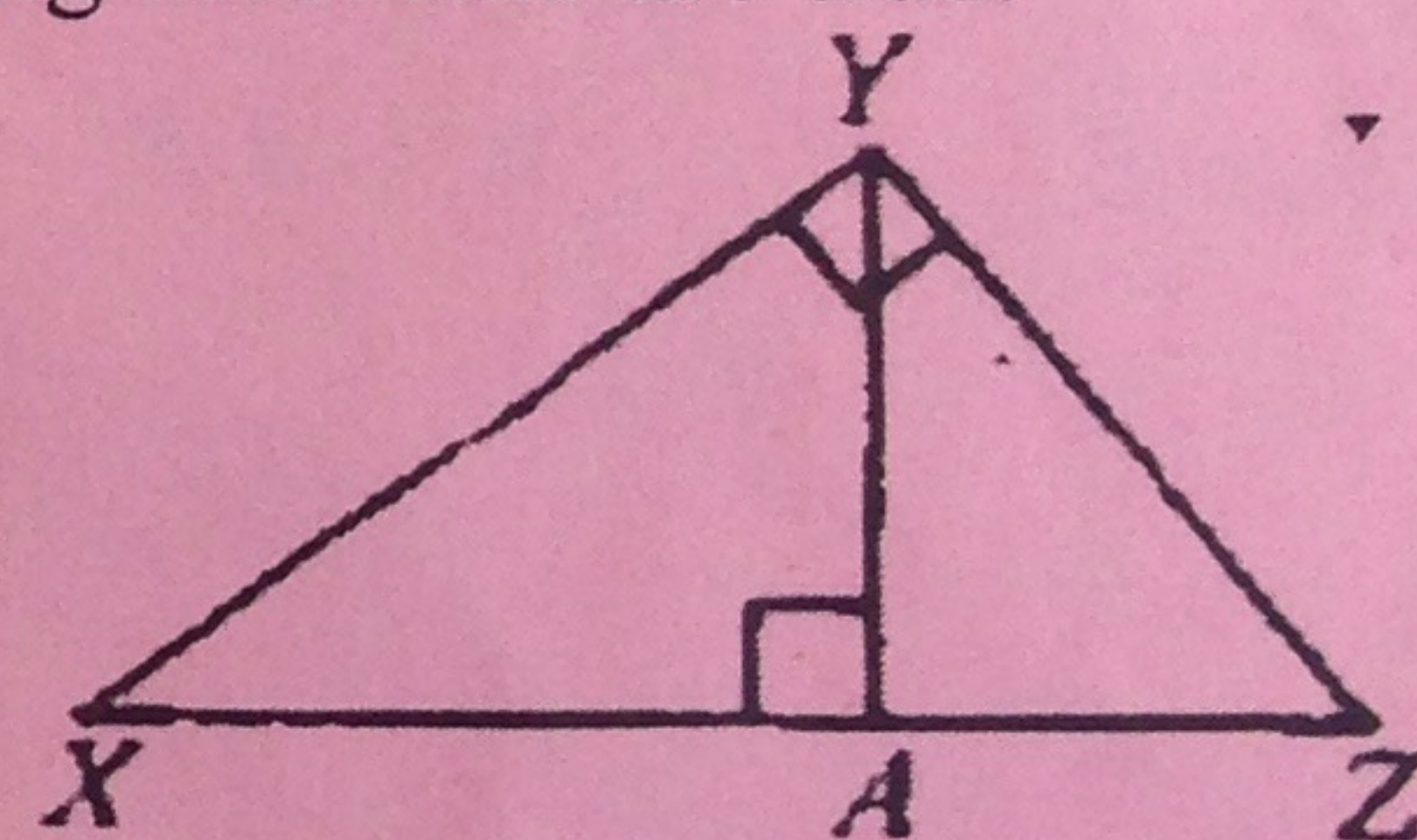
When the altitude to the hypotenuse is drawn in a right triangle, the following theorems are true.

1. the altitude to the hypotenuse is the geometric mean between the segments of the hypotenuse

$$\frac{\text{seg 1}}{\text{alt}} = \frac{\text{alt}}{\text{seg 2}}$$

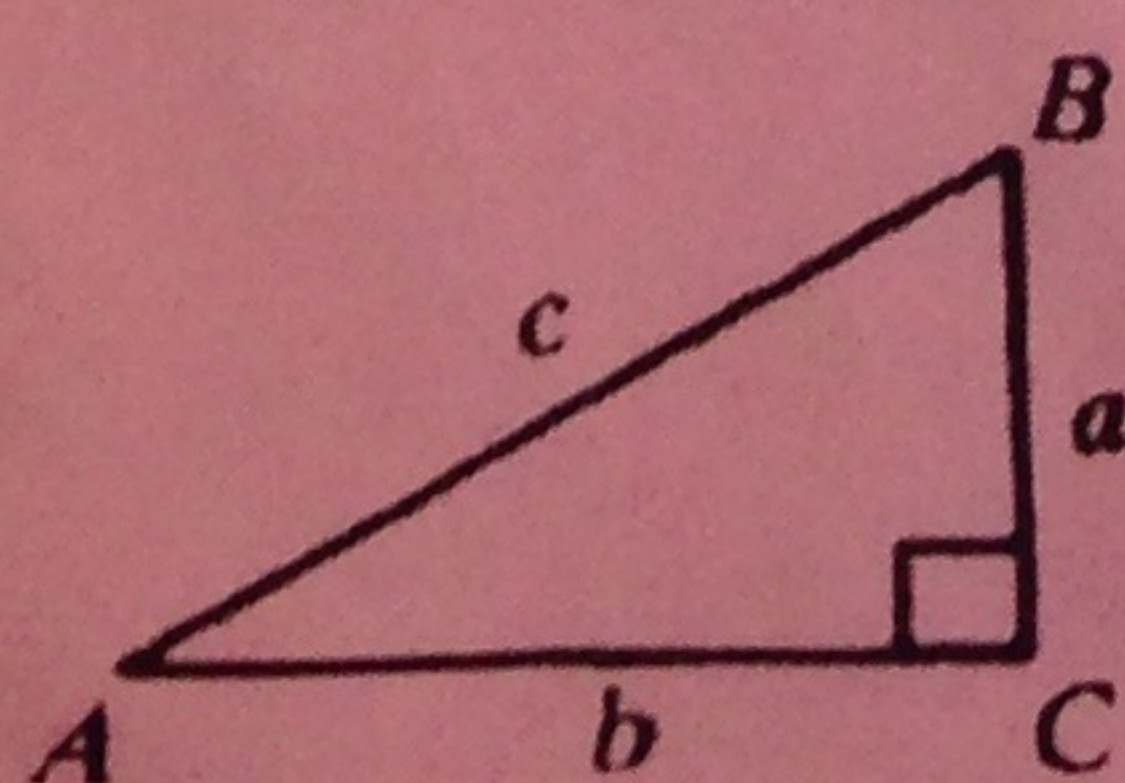
2. a leg of the right triangle is the geometric mean between the hypotenuse and the segment of the hypotenuse adjacent to the leg

$$\frac{\text{hyp}}{\text{leg}} = \frac{\text{leg}}{\text{adj. seg.}}$$



Trigonometry ratios: sine, cosine, tangent

S $\frac{O}{H}$ **C** $\frac{A}{H}$ **T** $\frac{O}{A}$



$$\sin A = \frac{\text{opp. leg}}{\text{hypotenuse}} =$$

$$\tan A = \frac{\text{opp. leg}}{\text{adj. leg}} =$$

$$\cos A = \frac{\text{adj. leg}}{\text{hypotenuse}} =$$