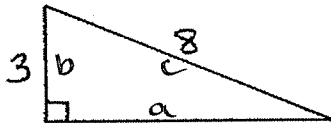


Name: _____

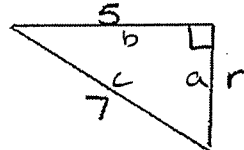
Block: _____

☺ Given a right triangle.

→ Use Pythagorean Theorem
and/or **SOHCAHTOA**.

① Find x 

$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 x^2 + 3^2 &= 8^2 \\
 x^2 + 9 &= 64 \\
 x^2 &= 55 \\
 x &= \sqrt{55} = 7.4
 \end{aligned}$$

② Find n 

$$\begin{aligned}
 a^2 + b^2 &= c^2 \\
 n^2 + 5^2 &= 7^2 \\
 n^2 + 25 &= 49 \\
 n^2 &= 24 \\
 n &= \sqrt{24} \\
 n &= 4.9
 \end{aligned}$$

In short: $\sin A = \frac{\text{opp}}{\text{hyp}}$; $\cos A = \frac{\text{adj}}{\text{hyp}}$; $\tan A = \frac{\text{opp}}{\text{adj}}$

To recall these trigonometric ratios quickly, remember the acronym:

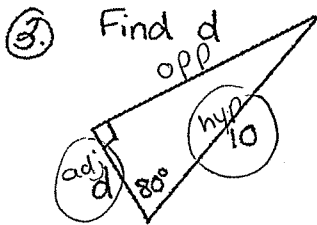
SOHCAHTOA

To solve for a missing angle:

1. Identify the acute angle you are **wanting** to find.
2. Label the triangle from that angle.
3. Identify the trig ratio to be used.
4. Set up your equation.
5. Solve.

To solve for a missing length:

1. Identify the acute angle you are **given**.
2. Label the triangle from that angle.
3. Identify the trig ratio to be used.
4. Set up your equation.
5. Solve.



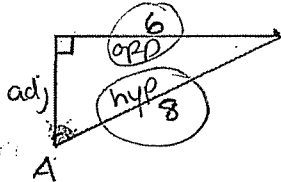
$$\cos 80^\circ = \frac{\text{adj}}{\text{hyp}}$$

$$\cos 80^\circ = \frac{d}{10}$$

$$10 \cos 80^\circ = d$$

$$d = 1.74$$

5. Find $\angle A$



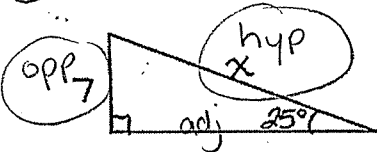
$$\sin A = \frac{\text{opp}}{\text{hyp}}$$

$$\sin A = \frac{6}{8}$$

$$\angle A = \sin^{-1}\left(\frac{6}{8}\right)$$

$$\angle A = 48.6^\circ$$

7. Find x



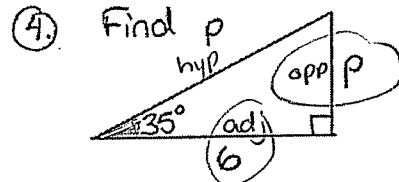
$$\sin 25^\circ = \frac{\text{opp}}{\text{hyp}}$$

$$\sin 25^\circ = \frac{7}{x}$$

$$x \sin 25^\circ = 7$$

$$x = \frac{7}{\sin 25^\circ}$$

$$x = 16.6$$

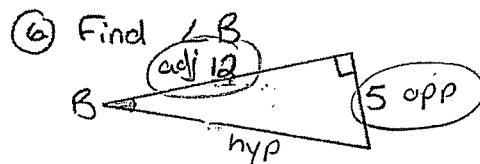


$$\tan 35^\circ = \frac{\text{opp}}{\text{adj}}$$

$$\tan 35^\circ = \frac{p}{6}$$

$$6 \tan 35^\circ = p$$

$$p = 4.2$$



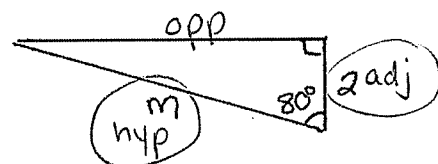
$$\tan B = \frac{\text{opp}}{\text{adj}}$$

$$\tan B = \frac{5}{12}$$

$$\angle B = \tan^{-1}\left(\frac{5}{12}\right)$$

$$\angle B = 22.6^\circ$$

8. Find m



$$\cos 80^\circ = \frac{\text{adj}}{\text{hyp}}$$

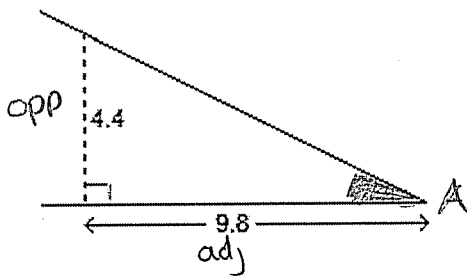
$$\cos 80^\circ = \frac{2}{m}$$

$$m \cos 80^\circ = 2$$

$$m = \frac{2}{\cos 80^\circ}$$

$$m = 11.5$$

9. Determine the angle of inclination of the line to the nearest tenth of a degree.



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

$$\tan A = \frac{4.4}{9.8}$$

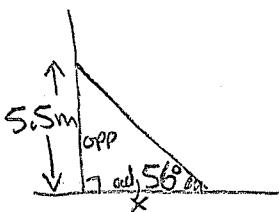
$$\angle A = \tan^{-1}\left(\frac{4.4}{9.8}\right)$$

$$\angle A = 24.2^\circ$$

- a. 63.3° b. 24.2° c. 65.8° d. 26.7°

10. A guy wire is attached to a tower at a point that is 5.5 m above the ground. The angle between the wire and the level ground is 56° . How far from the base of the tower is the wire anchored to the ground, to the nearest tenth of a metre?

- a. 3.1 m b. 6.6 m c. 3.7 m d. 8.2 m



$$\tan 56^\circ = \frac{\text{opp}}{\text{adj}}$$

$$\tan 56^\circ = \frac{5.5}{x}$$

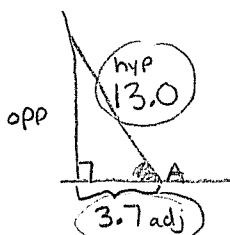
$$x \tan 56^\circ = 5.5$$

$$x = \frac{5.5}{\tan 56^\circ}$$

$$x = 3.7$$

11. A ladder is 13.0 m long. It leans against a wall. The base of the ladder is 3.7 m from the wall. What is the angle of inclination of the ladder to the nearest tenth of a degree?

- a. 73.5° b. 16.5° c. 74.1° d. 15.9°



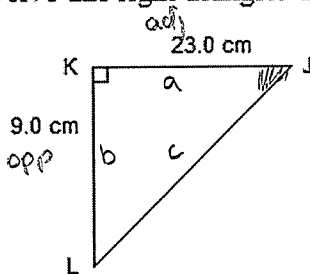
$$\cos A = \frac{\text{adj}}{\text{hyp}}$$

$$\cos A = \frac{3.7}{13.0}$$

$$\angle A = \cos^{-1}\left(\frac{3.7}{13.0}\right)$$

$$\angle A = 73.5^\circ$$

12. Solve this right triangle. Give the measures to the nearest tenth.



$$\tan J = \frac{\text{opp}}{\text{adj}}$$

$$\tan J = \frac{9}{23}$$

$$\angle J = \tan^{-1}\left(\frac{9}{23}\right)$$

$$\angle J = 21.4^\circ$$

$$\angle L = 180^\circ - 90^\circ - 21.4^\circ$$

$$\angle L = 68.6^\circ$$

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

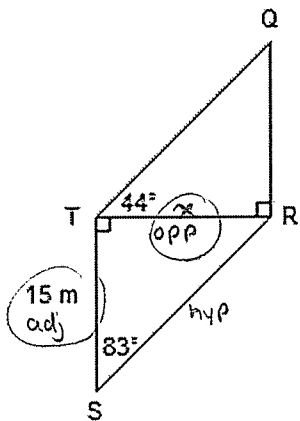
$$23^2 + 9^2 = c^2$$

$$610 = JL^2$$

$$JL = \sqrt{610}$$

$$JL = 24.7 \text{ cm}$$

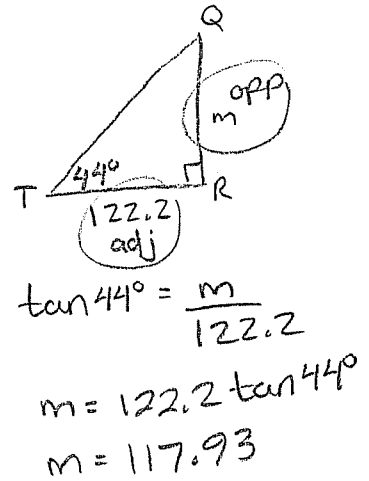
13. Determine the length of QR to the nearest metre.



$$\tan 83^\circ = \frac{x}{15}$$

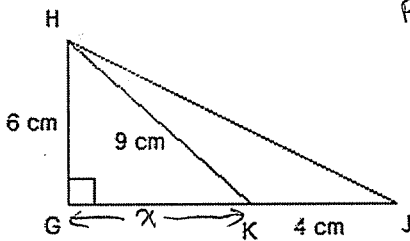
$$x = 15 \tan 83^\circ$$

$$x = 122.2$$



- a. 85 m b. 170 m c. 127 m **d. 118 m**

14. Calculate the measure of $\angle GHJ$ to the nearest tenth of a degree.



Find "x"

$$x^2 + 6^2 = 9^2$$

$$x^2 + 36 = 81$$

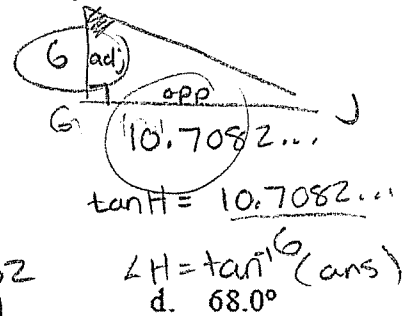
$$-36 \quad -36$$

$$x^2 = 45$$

$$x = \sqrt{45}$$

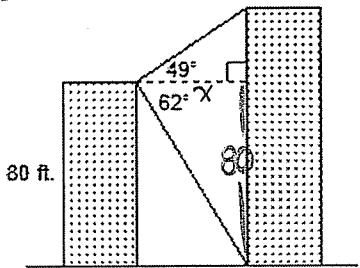
$$= 6.708203932$$

c. 60.7°



- a. 77.5° b. 29.3°

15. From the top of an 80-ft. building, the angle of elevation of the top of a taller building is 49° and the angle of depression of the base of this building is 62° . Determine the height of the taller building to the nearest foot.



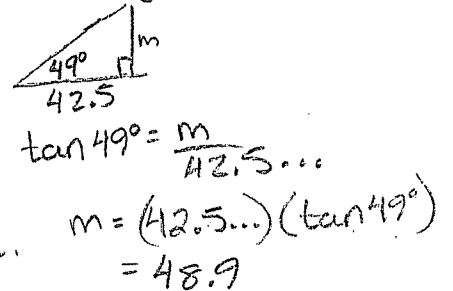
Find "x"

$$\tan 62^\circ = \frac{80}{x}$$

$$x \tan 62^\circ = 80$$

$$x = \frac{80}{\tan 62^\circ} = 42.536...$$

c. 129 ft.



- a. 211 ft. b. 112 ft. **c. 129 ft.** d. 276 ft.

$$\text{height} = 80 + 48.9$$

$$= 128.9$$