

0.4 Cosine Ratio Notes

Types of Cosine Questions

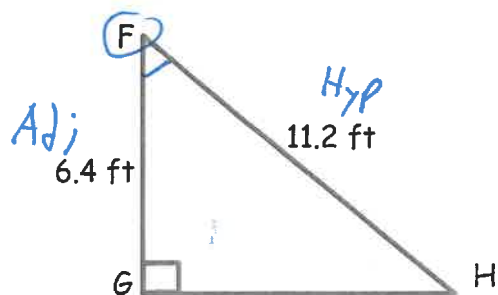
The relationship of cosine is:

$$\cos = \frac{\text{Adj}}{\text{Hyp}}$$

There are 3 types of cosine questions

Type 1 – Solving for the Angle

Solve for F:



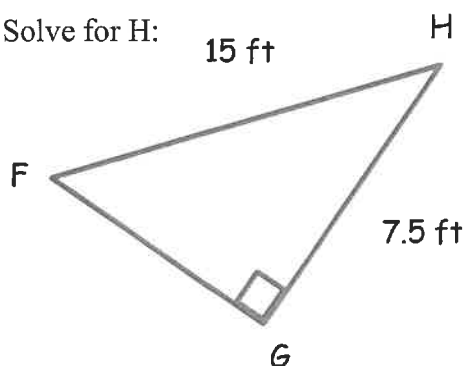
$$\cos = \frac{A}{H}$$

$$\cos F = \frac{6.4}{11.2}$$

$$F = 55^\circ$$

Show you know

Solve for H:

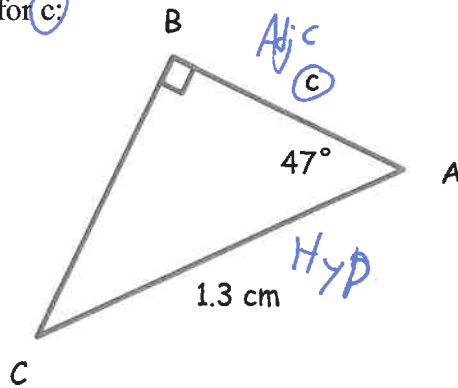


$$\cos = \frac{A}{H}$$

$$\cos H = \frac{7.5}{15}$$

$$H = 60^\circ$$

Type 2 – Solving for adjacent

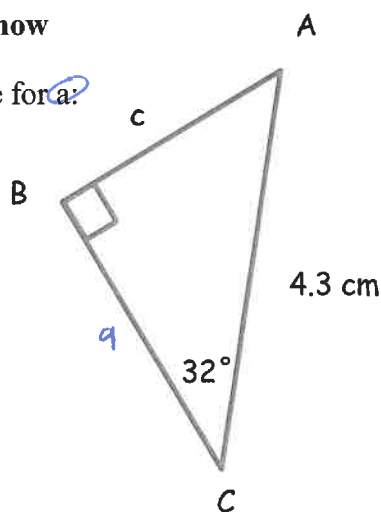
Solve for c :

$$\cos = \frac{A}{H}$$

$$\frac{\cos 47^\circ}{1} = \frac{c}{1.3}$$

$$c = 0.89 \text{ cm}$$

Show you know

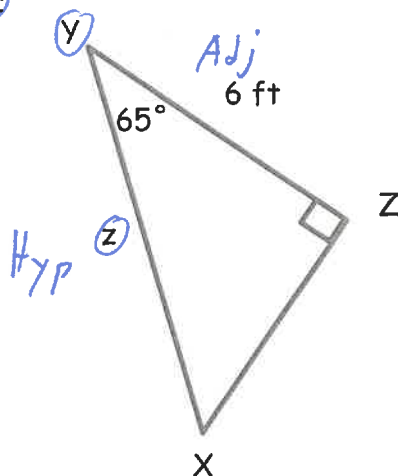
Solve for a :

$$\cos = \frac{A}{H}$$

$$\frac{\cos 32^\circ}{1} = \frac{a}{4.3}$$

$$a = 3.65 \text{ cm}$$

Type 3 – Solving for the hypotenuse

Solve for z :

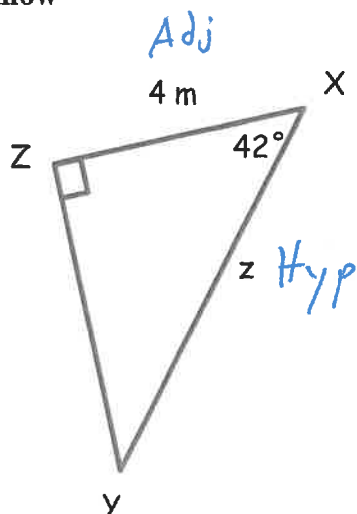
$$\cos = \frac{A}{H}$$

$$\frac{\cos 65^\circ}{1} = \frac{6 \text{ ft}}{z}$$

$$z = 14.20 \text{ ft}$$

Show you know

Solve for z:



$$\cos = \frac{A}{H}$$

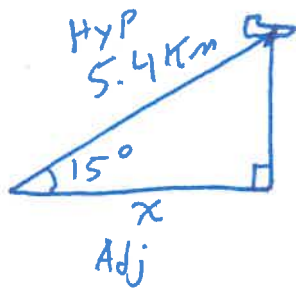
$$\frac{\cos 42^\circ}{1} = \frac{4}{z}$$

$$z = 5.38 \text{ m}$$

Word Problem Examples

Ex 1.

During a test flight, a water bomber took off and climbed steadily at an angle of 15° . It travelled 5.4 km to get to the forest fire nearby. How far is the forest fire from the takeoff point? Round the answer to the nearest tenth of a kilometer.



$$\cos = \frac{A}{H}$$

$$\frac{\cos 15^\circ}{1} = \frac{x}{5.4}$$

$$x = 5.22 \text{ km}$$

$$= 5.2 \text{ km}$$

Show you know

A wheelchair ramp is going to be installed outside the front doors of a school. The plans call for an angle of 5° and a ramp that is 8 m long. The horizontal distance of the ramp cannot be longer than 8.2 m. Will the ramp fit? Justify your answer.

yes

$$\cos = \frac{A}{H}$$

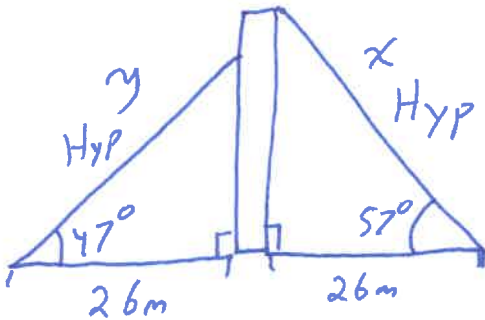
$$\frac{\cos 5^\circ}{1} = \frac{x}{8}$$

$$x = 7.97 \text{ m}$$



Ex 2.

Totem poles are almost always erected by being pulled upright with ropes into a wooden scaffold support until they are stable. Suppose that two of the ropes attached to a pole are at angles of elevation of 47° and 57° respectively. If the base of the ropes is approximately 26 m from the base of the totem pole, how long is each rope? Hint: draw a picture!



$$\cos = \frac{A}{H}$$

$$\frac{\cos 47^\circ}{1} = \frac{26}{y}$$

$$y = 38.12 \text{ m}$$

$$\cos = \frac{A}{H}$$

$$\frac{\cos 57^\circ}{1} = \frac{26}{x}$$

$$x = 47.74 \text{ m}$$