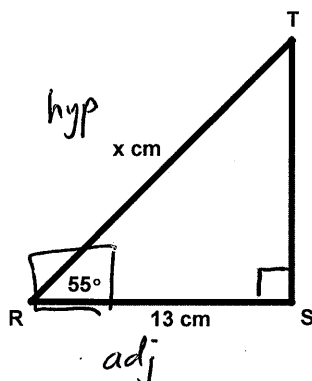


Analytic Geometry Right Triangle Trigonometry Practice

1. What is the value of x ? Round your answer to the nearest thousandth.

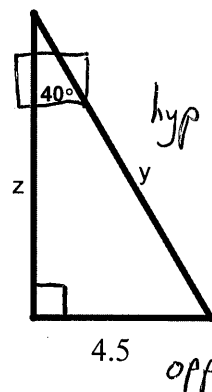


$$\frac{\cos 55}{1} = \frac{13}{x}$$

$$\frac{x}{1} = \frac{13}{\cos 55}$$

$$x = 22.665 \text{ cm}$$

2. Find the lengths of y and z in the diagram below.

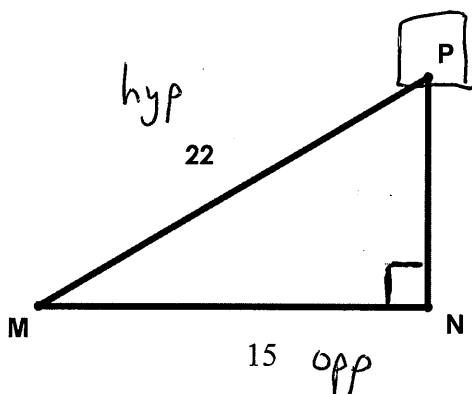


$$\frac{\sin 40}{1} = \frac{4.5}{y}$$

$$\frac{y}{1} = \frac{4.5}{\sin 40}$$

$$y = 7.000$$

3. What is the measure of $\angle P$?

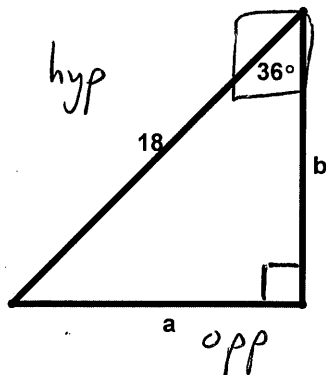


$$\sin P = \frac{15}{22}$$

$$P = \sin^{-1}\left(\frac{15}{22}\right)$$

$$P = 42.986^\circ$$

4. What is the value of a and b to the nearest tenth?



$$a^2 + b^2 = 18^2$$

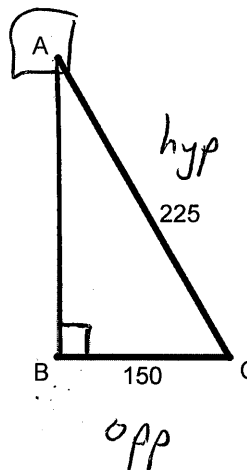
$$10.58^2 + b^2 = 18^2$$

$$b = 14.562$$

$$\frac{\sin 36}{1} = \frac{a}{18}$$

$$a = 18 \sin 36 = 10.580$$

5. What is the measure of $\angle A$ to the nearest degree?

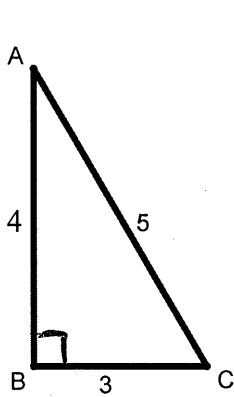


$$\sin A = \frac{150}{225}$$

$$A = \sin^{-1}\left(\frac{150}{225}\right)$$

$$A = 41.810^\circ$$

6. Suppose $\triangle ABC$ is a right triangle with $\angle B$ the right angle. Explain the relationship between Tangent of angle A and Tangent of angle C.



$$\tan A = \frac{3}{4}$$

$$\tan C = \frac{4}{3}$$

reciprocals of each other.

7. Explain the relationships between the sine and cosine of complementary (the 2 acute angles) angles. (Use triangle ABC above and find $\sin A$ and $\cos C$.)

$$\sin A = \frac{3}{5}$$

$$\cos C = \frac{3}{5}$$

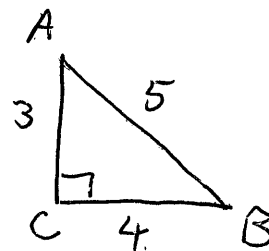
The Adjacent of C is also the opposite of A.

8. In right $\triangle ACB$, $AC = 3$, $BC = 4$, and $AB = 5$. Draw a figure.

A. Find the exact value of $\sin B$. $= \frac{3}{5}$

B. Find the exact value of $\cos A$. $= \frac{3}{5}$

C. Find the exact value of $\tan A$. $= \frac{4}{3}$

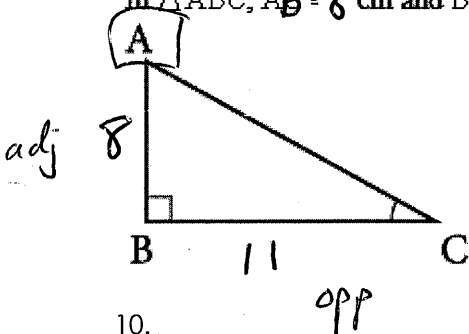


D. Find measurement of $\angle A$ (to the nearest degree). $\sin A = \frac{4}{5}$ $A = \sin^{-1}(\frac{4}{5})$

$$A = 53.130^\circ$$

9.

In $\triangle ABC$, $AB = 8$ cm and $BC = 11$ cm. Determine the tangent ratio of $\angle A$, to the nearest thousandth.



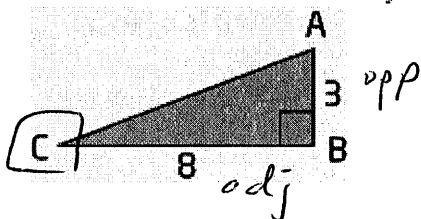
$$\tan A = \frac{11}{8}$$

$$A = \tan^{-1}(\frac{11}{8})$$

$$A = 53.972^\circ$$

10.

Determine the measure of $\angle C$, to the nearest degree.



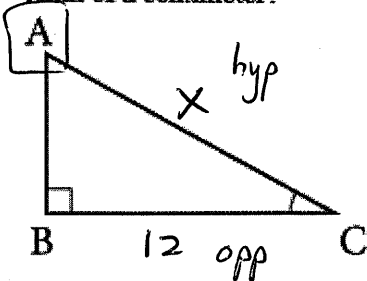
$$\tan C = \left(\frac{3}{8}\right)$$

$$C = \tan^{-1}(\frac{3}{8})$$

$$C = 20.556^\circ$$

11.

In the triangle, $BC = 12$ cm and $\sin A = 0.583$. What is the length of the hypotenuse, to the nearest tenth of a centimeter?



$$\sin A = \frac{12}{X}$$

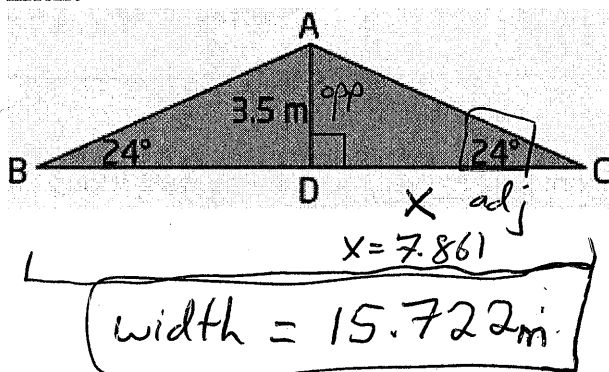
$$\frac{0.583}{1} = \frac{12}{X}$$

$$\frac{X}{1} = \frac{12}{0.583}$$

$$X = 20.583 \text{ cm}$$

12.

A roof is shaped like an isosceles triangle. The slope of the roof makes an angle of 24° with the horizontal, and has an altitude of 3.5 m. Determine the width of the roof, to the nearest thousandth of a meter.



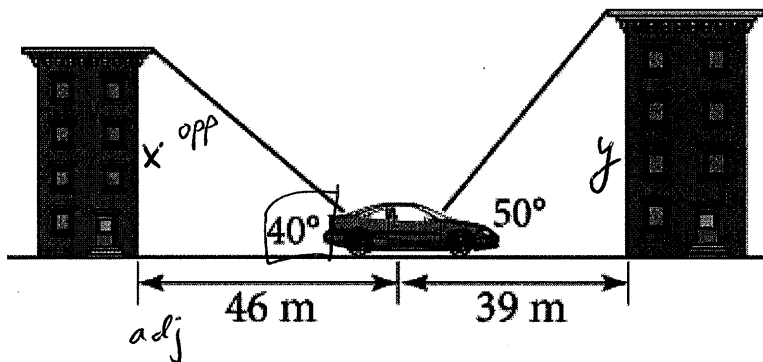
$$\frac{\tan 24}{1} = \frac{3.5}{X}$$

$$\frac{X}{1} = \frac{3.5}{\tan 24} \quad x = 7.861$$

$$\leftarrow 2(7.861)$$

13.

Matthew parks his car between Karen's and Patrick's apartment buildings. The car is 46 m in front of Karen's apartment building. The angle of elevation from the car to the top of the building is 40° . Matthew's car is 39 m behind Patrick's apartment building. The angle of elevation from the car to the top of the building is 50° .



a) Determine the height of each building, to the nearest meter.

$$\frac{\tan 40}{1} = \frac{x}{46}$$

$$x = 46 \tan 40$$

$$x = 38.598 \text{ m}$$

$$\frac{\tan 50}{1} = \frac{y}{39}$$

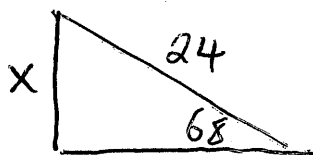
$$y = 39 \tan 50$$

$$y = 46.478 \text{ m}$$

b) State which building is taller, and by how much.

The building on right
is taller by 7.879 m

14. A 24 foot ladder leans against a building and makes an angle of 68° with the ground. To the nearest foot, how far up from the bottom of the building is the top of the ladder?

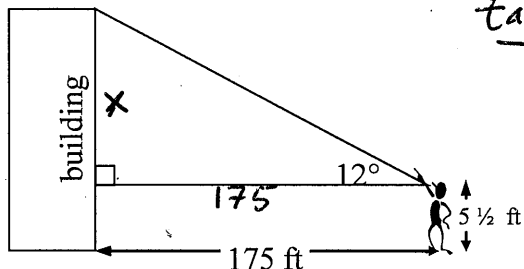


$$\frac{\sin 68}{1} = \frac{x}{24}$$

$$x = 24 \sin 68$$

$$x = 22.252 \text{ ft}$$

15. A man that is $5\frac{1}{2}$ feet tall walks 175 feet from a building and looks at the highest point on the building. The angle formed by the person's line of sight and the horizontal is 12° . To the nearest foot, how tall is the building?



$$\frac{\tan 12}{1} = \frac{x}{175}$$

$$\text{building height} = 37.197 + 5.5$$

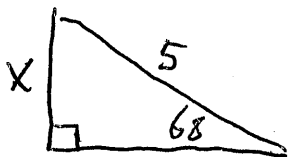
$$= 42.697$$

$$x = 175 \tan 12$$

$$x = 37.197$$

$$\text{building} = 42.697 \text{ ft.}$$

16. You are building a tent. The rope from the top of the tent pole to the ground measures 5 ft long. The angle of elevation is 68° .



$$\frac{\sin 68}{1} = \frac{x}{5}$$

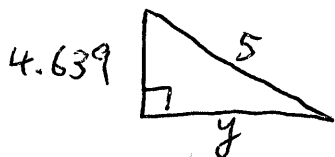
$$x = 4.639 \text{ ft.}$$

$$x = 5 \sin 68$$

- A. Find the height of the pole to the nearest thousandth.

$$x = 4.639 \text{ ft.}$$

- B. Find the distance from the base of the pole to the stake to the nearest thousandth.

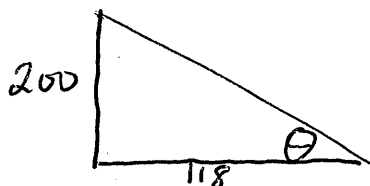


$$y^2 + 4.639^2 = 5^2$$

$$y^2 = 3.508$$

$$y = 1.873 \text{ ft.}$$

17. If a 200 foot tree casts a 118 foot shadow, what is the angle of elevation of the sun? Sketch a diagram, set up an equation and solve.



$$\tan \theta = \frac{200}{118}$$

$$\theta = \tan^{-1}\left(\frac{200}{118}\right)$$

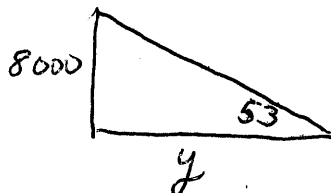
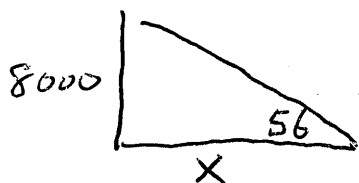
$$\theta = 59.459^\circ$$

$$18 \text{ a) } 6028 - 5786$$

$$632.364 \text{ ft}$$

$$\text{Speed} = \frac{d}{t} = \frac{632.364}{13}$$

18. A plane is flying away from you. Right now, you can see it at an angle of elevation of 56° . Thirteen seconds later, you can see it at an angle of 53° . If you know it's at an altitude of 8,000 feet, how far has it traveled in that time? B) How fast is it traveling?



$$\frac{\tan 56}{1} = \frac{8000}{x}$$

$$\frac{x}{1} = \frac{8000}{\tan 56}$$

$$x = 5396.068 \text{ ft}$$

$$\frac{\tan 53}{1} = \frac{8000}{y}$$

$$\frac{y}{1} = \frac{8000}{\tan 53}$$

$$y = 6028.432$$

$$48.64 \text{ ft/sec}$$