

1. Determine if the following side lengths could be used to form a triangle. Then determine if the triangle would be an acute, obtuse, or right triangle. Justify your answer!

a. 2, 3, 4

$2 + 3 > 4$ ✓

$2^2 + 3^2 ? 4^2$

$13 ? 16$

<

obtuse

b. 7, 11, 14

$7 + 11 > 14$ ✓

$7^2 + 11^2 ? 14^2$

$170 ? 196$

<

obtuse

c. 8, 10, 12 $8 + 10 > 12$ ✓

$8^2 + 10^2 ? 12^2$

$164 ? 144$

>

Acute

d. 9, 12, 15

$9 + 12 > 15$ ✓

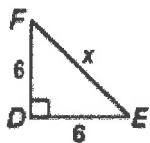
$9^2 + 12^2 ? 15^2$

$225 ? 225$

=

Right

2. Find x in $\triangle DEF$. Are the side lengths a pythagorean triple?



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

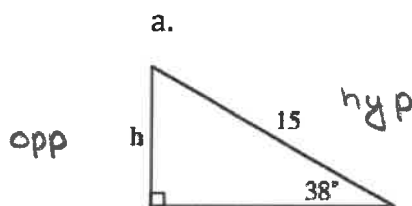
$72 = x^2$

$\sqrt{72} = x$

$8.5 \approx x$

not a
Pythagorean triple

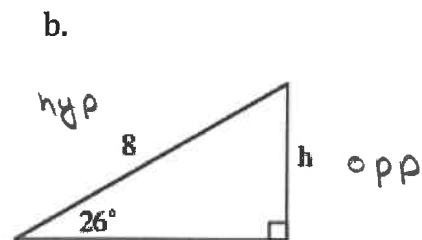
3. Use trigonometric ratios to solve for each variable in the figures below:



$\sin 38 = \frac{h}{15}$

$15 \sin 38 = h$

$9.2 \approx h$

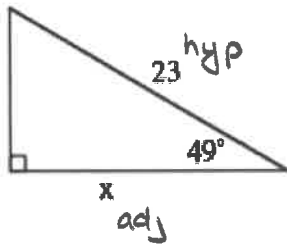


$\sin 26 = \frac{h}{8}$

$8 \sin 26 = h$

$3.5 \approx h$

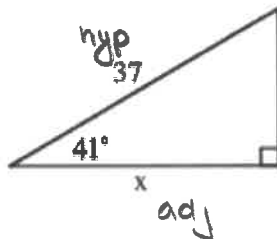
c.



$$\cos 49 = x/23$$

$$23 \cos 49 = x$$

d. $15.1 \approx x$



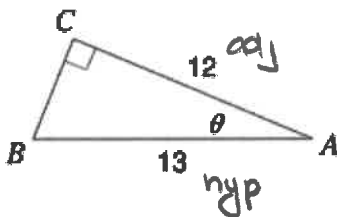
$$\cos 41 = x/37$$

$$37 \cos 41 = x$$

$$27.9 \approx x$$

4. Solve for the missing angle:

a.

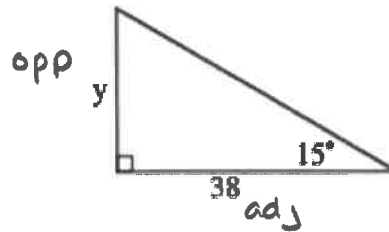


$$\cos \theta = 12/13$$

$$\theta = \cos^{-1}(12/13)$$

$$\theta = 22.6^\circ$$

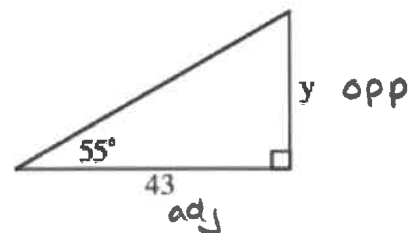
e.



$$\tan 15 = y/38$$

$$38 \tan 15 = y$$

f. $10.2 \approx y$

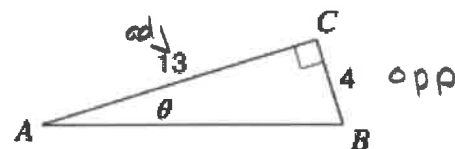


$$\tan 55 = y/43$$

$$43 \tan 55 = y$$

$$61.4 \approx y$$

b.

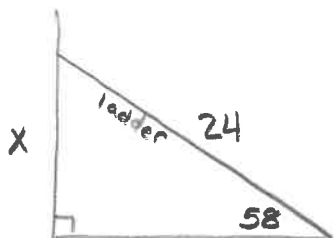


$$\tan \theta = 4/13$$

$$\theta = \tan^{-1}(4/13)$$

$$\theta = 17.1^\circ$$

5. If a 24-foot ladder makes a 58° angle with the ground, how many feet up a wall will it reach? Round your answer to the nearest tenth.

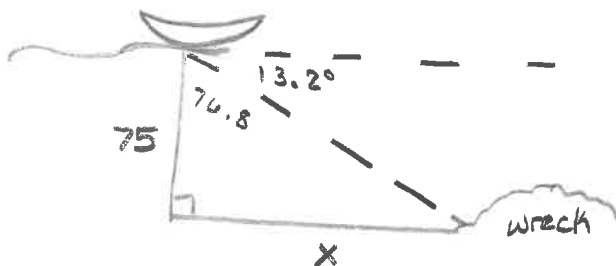


$$\sin 58 = \frac{x}{24}$$

$$24 \sin 58 = x$$

$$20 \text{ ft} = x$$

6. A ship's sonar finds that the angle of depression to a wreck on the bottom of the ocean is 13.2° . If a point on the ocean floor is 75 meters directly below the ship, how many meters is it from the point on the ocean floor to the wreck? Round to the nearest tenth.

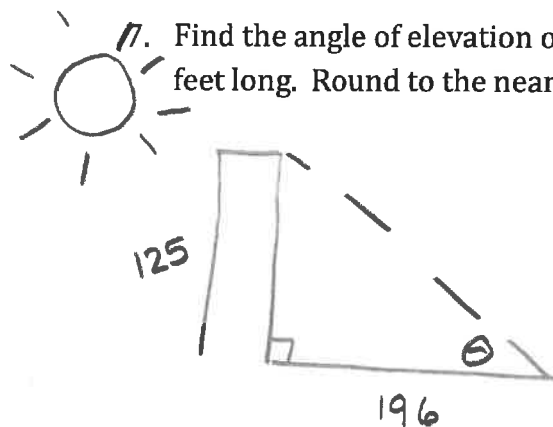


$$\tan 76.8 = \frac{x}{75}$$

$$75 \tan 76.8 = x$$

$$320 \text{ m} = x$$

7. Find the angle of elevation of the sun if a building 125 feet tall casts a shadow 196 feet long. Round to the nearest degree.



$$\tan \theta = \frac{125}{196}$$

$$\theta = \tan^{-1} \left(\frac{125}{196} \right)$$

$$\theta = 33^\circ$$

