

Name: Key Date: _____

CHCAHTOA:

1) a) Find the 3 trig ratios from Angle A and Angle B.

$$\sin A = \frac{15}{17} \quad \cos A = \frac{8}{17} \quad \tan A = \frac{15}{8}$$

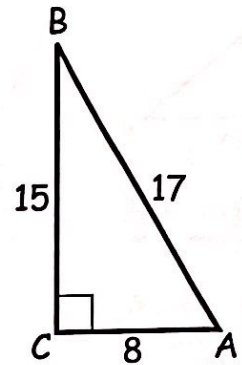
$$\sin B = \frac{8}{17} \quad \cos B = \frac{15}{17} \quad \tan B = \frac{8}{15}$$

a) How do the ratios compare for the two angles?

$$\sin A = \cos B$$

$$\cos A = \sin B$$

The tangents are reciprocals of each other

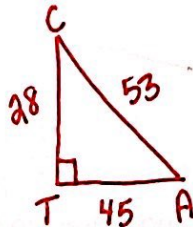


2) Draw $\triangle CAT$ where $\angle ATC = 90^\circ$, $CA = 53$, and $CT = 28$.

a) What is the length of AT? 45

b) What is $\sin C$? $\frac{45}{53}$

c) What is $\tan A$? $\frac{28}{45}$



$$28^2 + b^2 = 53^2$$

$$784 + b^2 = 2809$$

$$\sqrt{b^2} = \sqrt{2025}$$

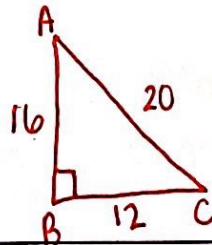
$$b = 45$$

Draw $\triangle ABC$ where $\angle B = 90^\circ$ and $\sin A = \frac{12}{20}$.

a) What is the length of AB? 16

b) What is $\tan A$? $\frac{12}{16} = \frac{3}{4}$

c) What is $\cos A$? $\frac{16}{20} = \frac{4}{5}$



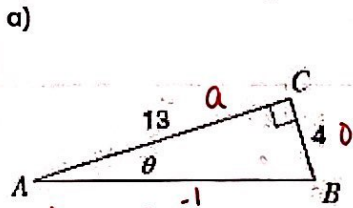
$$12^2 + b^2 = 20^2$$

$$144 + b^2 = 400$$

$$\sqrt{b^2} = \sqrt{256}$$

$$b = 16$$

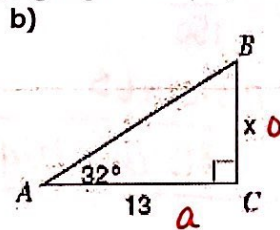
4) Solve for the missing side or angle using Trig Ratios (sin, cos, tan).



$$\tan \theta = \frac{4}{13}$$

$$\theta = \tan^{-1}\left(\frac{4}{13}\right)$$

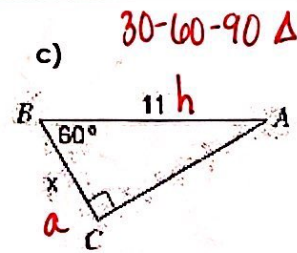
$$\theta = 17^\circ$$



$$\tan 32^\circ = \frac{x}{13}$$

$$13 \cdot \tan 32 = x$$

$$x = 8.1$$



$$\cos 60^\circ = \frac{x}{11}$$

$$11 \cdot \cos 60 = x$$

$$x = 5.5$$

d)

$\tan 50.1 = \frac{x}{5}$
 $x = 5 \cdot \tan 50.1$
 $x = 6$

e)

$\tan \theta = \frac{7.7}{14}$
 $\theta = \tan^{-1} \left(\frac{7.7}{14} \right)$
 $\theta = 29^\circ$

f)

$\sin 57 = \frac{10.8}{x}$
 $x \cdot \sin 57 = 10.8$
 $x = \frac{10.8}{\sin 57} = 12.9$

5) An 8 foot ladder is leaning against a wall so that the base is 5 feet from the base of the wall. What angle does the ladder make with the ground? Round to the nearest tenth.

$\cos x = \frac{5}{8}$
 $x = \cos^{-1} \left(\frac{5}{8} \right)$
 $x = 51^\circ$

6) A surveyor is standing 25 feet from a building and is looking at the top with an angle of elevation of 65°. How tall is the building? Round to the nearest tenth.

$\tan 65 = \frac{x}{25}$
 $x = 25 \cdot \tan 65$
 $x = 53.6 \text{ ft}$

7) A kite is being flown using 150 yards of string. The kite has an angle of elevation with the ground of 65 degrees. How high above the ground is the kite?

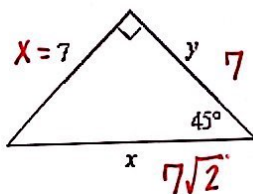
$\sin 65 = \frac{x}{150}$
 $x = 150 \cdot \sin 65$
 $x = 136 \text{ yd high}$

8) In the triangle, BC = 12 cm and $\tan C = 0.75$. What is the length of the hypotenuse?

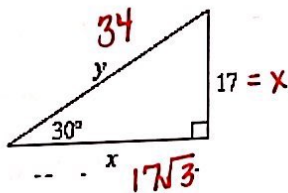
$\tan C = 0.75$
 $C \approx 37^\circ$
 $\cos 37 = \frac{12}{x}$
 $x \cdot \cos 37 = 12$
 $x = \frac{12}{\cos 37} = 15$
Hypotenuse = 15

9. Find all missing sides using special right triangle patterns:

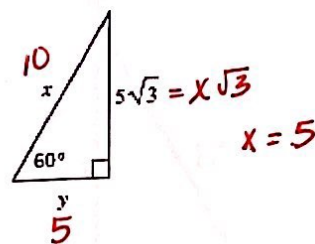
a.



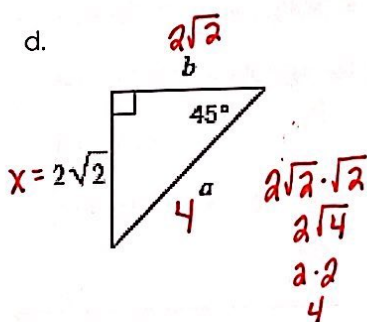
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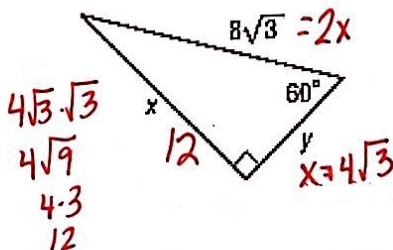
c.



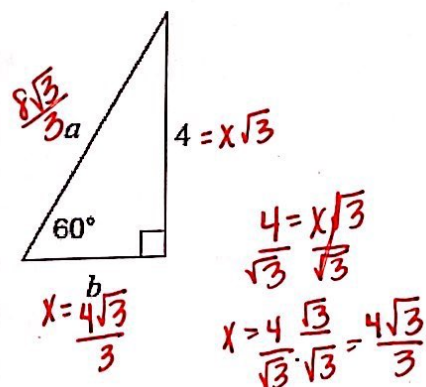
d.



e.



f.



10. If $\sin 47^\circ = .73$, what is the cosine of 43° ? .73

11. If $\cos 82^\circ = .14$, what is the sine of 8° ? .14

12. Find the value of θ for which $\sin \theta = \cos 22^\circ$. $\sin 68^\circ$

13. Find the value of θ for which $\cos \theta = \sin 41^\circ$. $\cos 49^\circ$