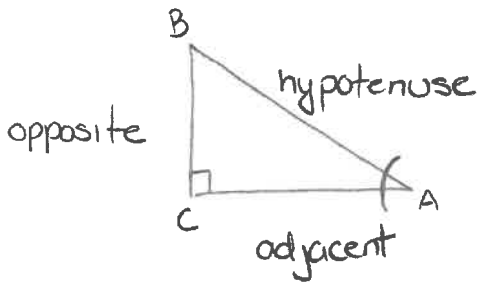


Trigonometric Ratio: ratio of the lengths of 2 sides of a triangle

Soh Cah Toa

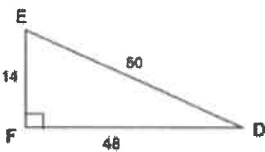


$$\sin A = \frac{\text{opposite}}{\text{hypotenuse}} \quad \star \text{ Soh}$$

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}} \quad \star \text{ Cah}$$

$$\tan A = \frac{\text{opposite}}{\text{adjacent}} \quad \star \text{ Toa}$$

1. Find the sine, cosine, and tangent of angle D and E



$$\sin D = \frac{14}{50} = \frac{7}{25}$$

$$\sin E = \frac{48}{50} = \frac{24}{25}$$

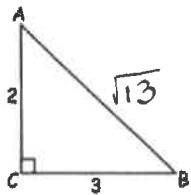
$$\cos D = \frac{48}{50} = \frac{24}{25}$$

$$\cos E = \frac{14}{50} = \frac{7}{25}$$

$$\tan D = \frac{14}{48} = \frac{7}{24}$$

$$\tan E = \frac{48}{14} = \frac{24}{7}$$

2. Find the sine, cosine, and tangent of angle A and B



$$\sin A = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$$

$$\sin B = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$$

$$\cos A = \frac{2}{\sqrt{13}} = \frac{2\sqrt{13}}{13}$$

$$\cos B = \frac{3}{\sqrt{13}} = \frac{3\sqrt{13}}{13}$$

$$\tan A = \frac{3}{2}$$

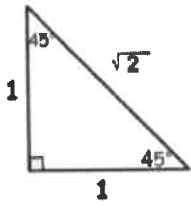
$$\tan B = \frac{2}{3}$$

$$2^2 + 3^2 = x^2$$

$$4 + 9 = x^2$$

$$\sqrt{13} = x$$

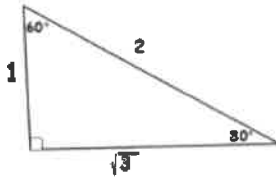
3. Trigonometric Ratios for Special Right Triangles:



$$\sin 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\cos 45^\circ = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$\tan 45^\circ = 1$$



$$\sin 30^\circ = \frac{1}{2}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2}$$

$$\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\cos 60^\circ = \frac{1}{2}$$

$$\tan 60^\circ = \sqrt{3}$$

Calculator must be in degrees!

4. Use a calculator to approximate the following to three decimal places:

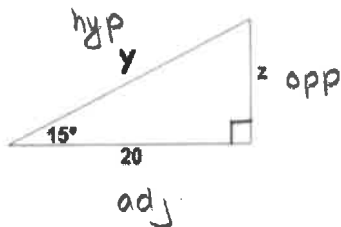
a. $\sin 35^\circ = 0.574$

b. $\cos 10^\circ = 0.985$

c. $\tan 74^\circ = 3.487$

5. Solve for the variable(s). Round the final answer(s) to one decimal place. Do not round until the final answer.

a.



solve for z
opp & adj $\rightarrow \tan$

$$\tan 15 = \frac{z}{20}$$

$$20 \tan 15 = z$$

$$5.4 \approx z$$

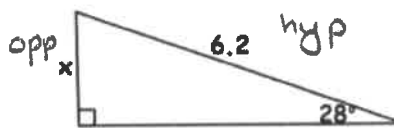
solve for y
adj & hyp $\rightarrow \cos$

$$\cos 15 = \frac{20}{y}$$

$$y = \frac{20}{\cos 15}$$

$$y \approx 20.7$$

b.



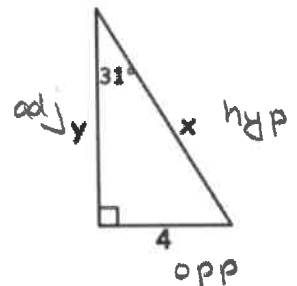
opp & hyp $\rightarrow \sin$

$$\sin 28 = \frac{x}{6.2}$$

$$6.2 \sin 28 = x$$

$$2.9 \approx x$$

c.



$$\sin 31 = \frac{4}{x}$$

$$x = \frac{4}{\sin 31}$$

$$x \approx 7.8$$

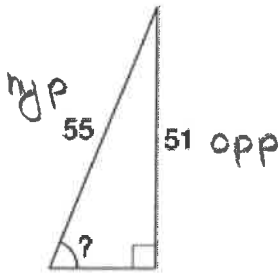
$$\tan 31 = \frac{4}{y}$$

$$y = \frac{4}{\tan 31}$$

$$y \approx 6.7$$

6. Find the measure of the indicated angle to the nearest tenth:

a.



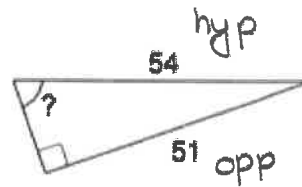
$$\sin \theta = \frac{51}{55}$$

$$\sin^{-1}(\sin \theta) = \sin^{-1}\left(\frac{51}{55}\right)$$

$$\theta = \sin^{-1}\left(\frac{51}{55}\right)$$

$$\theta \approx 68^\circ$$

c.

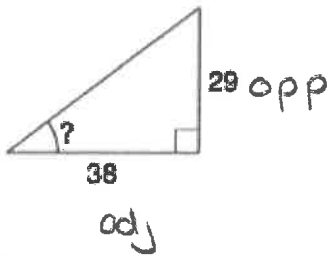


$$\sin \theta = \frac{51}{54}$$

$$\theta = \sin^{-1}\left(\frac{51}{54}\right)$$

$$\theta \approx 70.8^\circ$$

b.

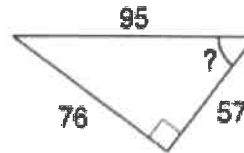


$$\tan \theta = \frac{29}{38}$$

$$\theta = \tan^{-1}\left(\frac{29}{38}\right)$$

$$\theta \approx 37.3^\circ$$

d.



* can use any trig ratio *

$$\sin \theta = \frac{76}{95}$$

$$\theta = \sin^{-1}\left(\frac{76}{95}\right)$$

$$\theta = 53.1^\circ$$

