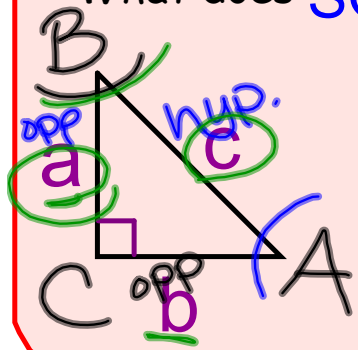


Warm Up:

What does **SOH CAH TOA** stand for?

$\theta = \text{theta}$
(angle)



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\sin A = \frac{a}{c}$$

$$\sin B = \frac{b}{c}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\cos B = \frac{a}{c}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

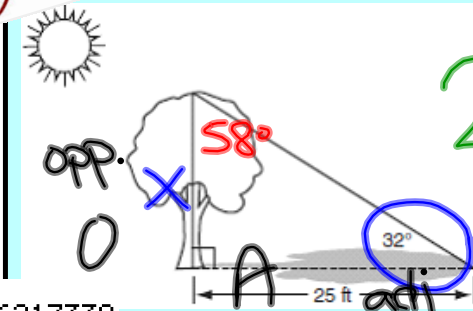
Unit 6: Trigonometry
& The Unit Circle

Right Triangle Trigonometry

SOH (Review) CAH TA

Examples

1. A tree casts a 25-foot shadow as shown below.



$$25 \tan 32^\circ = \frac{x}{25}$$

$$15.6 = x$$

25 * tan(32) = 15.6217338

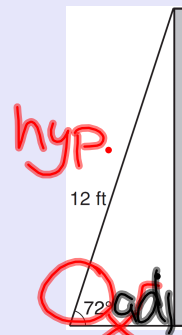
If the angle of elevation from the tip of the shadow to the top of the tree is 32° , what is the height of the tree to the nearest tenth of a foot?

SOH CAH TA

2. As shown in the diagram below, a ladder 12 feet long leans against a wall and makes an angle of 72° with the ground.

$$12 \cdot \cos 72 = \frac{x}{12}$$

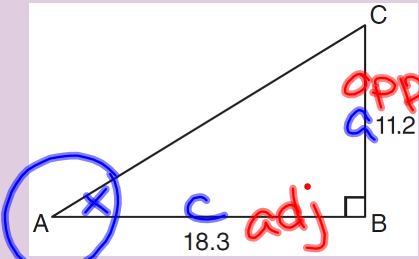
$$3.7 = x$$



Find, to the nearest tenth of a foot, the distance from the wall to the base of the ladder.

12 cos(72) = 3.708203932

3. In right triangle ABC shown below, AB=18.3 and BC=11.2



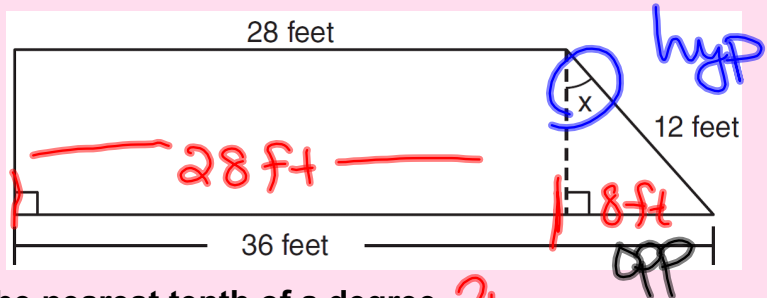
~~$\tan^{-1}(\tan A) = \frac{11.2}{18.3}$~~
 $A = 31.5^\circ$

What is the measure of $\angle A$, to the nearest tenth of a degree?

$\tan^{-1}(11.2/18.3)$
 31.46754337

3. A trapezoid is shown below.

~~$\sin X = \frac{8}{12}$~~
 $X = 41.8^\circ$



Calculate the measure of x to the nearest tenth of a degree.

$\sin^{-1}(8/12)$
 41.8103149

$\frac{36}{-28}$

Exact Values of Trig Functions

	0°	30°	45°	60°	90°
sin θ	$\frac{0}{2} = 0$	$\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$	$\frac{1}{1} = 1$
cos θ	$\frac{1}{1} = 1$	$\frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2}$	$\frac{1}{2} = \frac{1}{2}$	$\frac{0}{1} = 0$
$\frac{\sin \theta}{\cos \theta} = \tan \theta$	$\frac{0}{1} = 0$	$\frac{\frac{\sqrt{3}}{2}}{\frac{\sqrt{3}}{2}} = 1$ OR $\frac{\sqrt{3}}{3}$	$\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$	$\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$	$\frac{1}{0} = \text{undefined}$

REVERSE ORDER ↙

Special Right Triangles: $\frac{\sqrt{3}}{3}$ $\frac{\sqrt{3}}{2}$

30°, 60°, 90°
45°, 45°, 90°

Show: $\tan \theta = \frac{\sin \theta}{\cos \theta}$ ★ SOH CAHTA

$$\tan \theta = \frac{\frac{\text{opp}}{\text{hyp}}}{\frac{\text{adj}}{\text{hyp}}}$$

$$\tan \theta = \frac{\text{opp}}{\text{hyp}} \div \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{hyp}} \cdot \frac{\text{hyp}}{\text{adj}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\tan \theta = \tan \theta \quad \checkmark$$

HW: p. 380 #33-36, 38, 40, 42-43

Developing Skills

In 3–44, find the exact value.

33. $\sin 0^\circ + \cos 0^\circ + \tan 0^\circ$

34. $\sin 45^\circ + \cos 60^\circ$

35. $\sin 90^\circ + \cos 0^\circ + \tan 45^\circ$

36. $(\cos 60^\circ)^2 + (\sin 60^\circ)^2$

38. $(\sin 30^\circ)(\cos 60^\circ)$

40. $(\sin 45^\circ)(\cos 45^\circ)(\tan 45^\circ)$

42. $\frac{\tan 30^\circ}{\cos 60^\circ}$

43. $\frac{\sin 45^\circ}{\cos 45^\circ}$

$$\approx \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{2}}{2}\right)(1)$$

$$\frac{\sqrt{4}}{4} = \frac{2}{4} = \frac{1}{2}$$