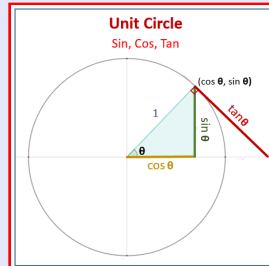


# Trigonometry Lecture 4

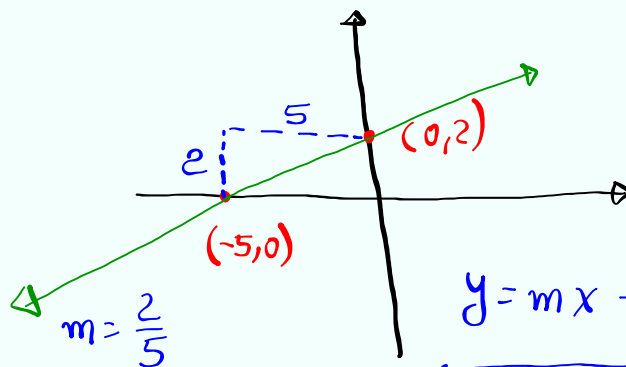


Feb 19-8:47 AM

Given  $2x - 5y = -10$

x	y
0	2
-5	0

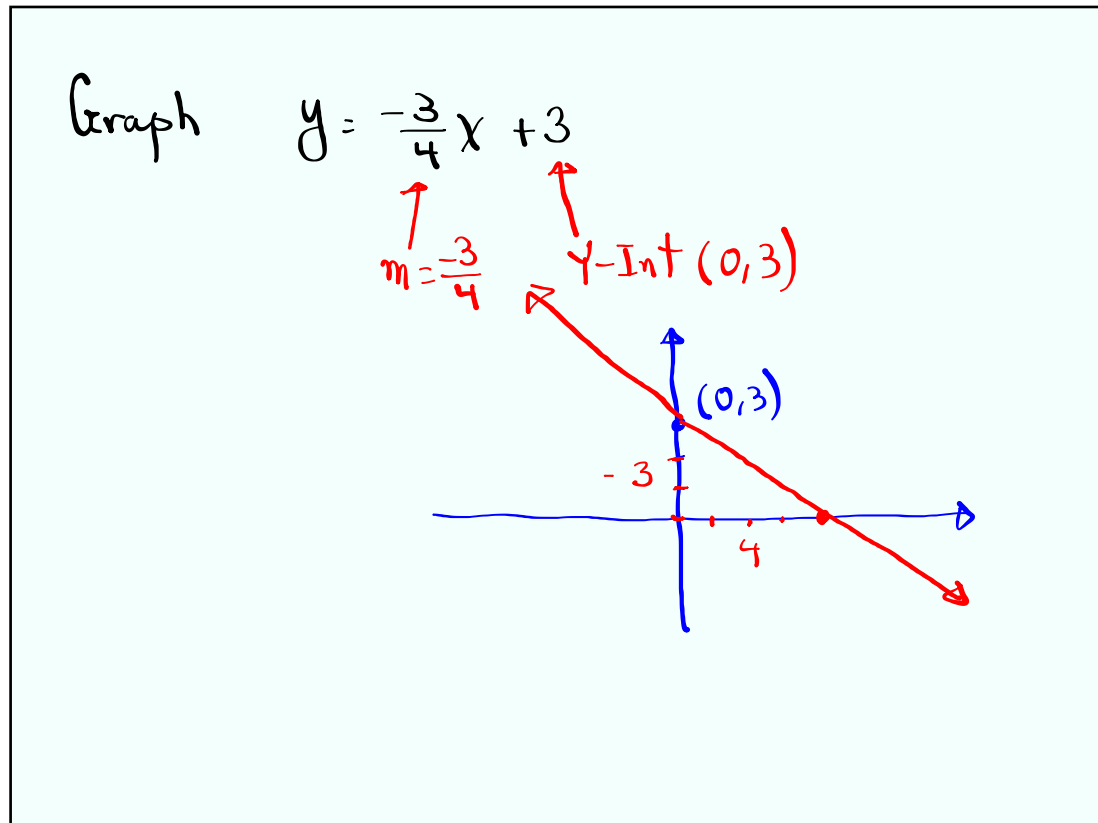
Graph



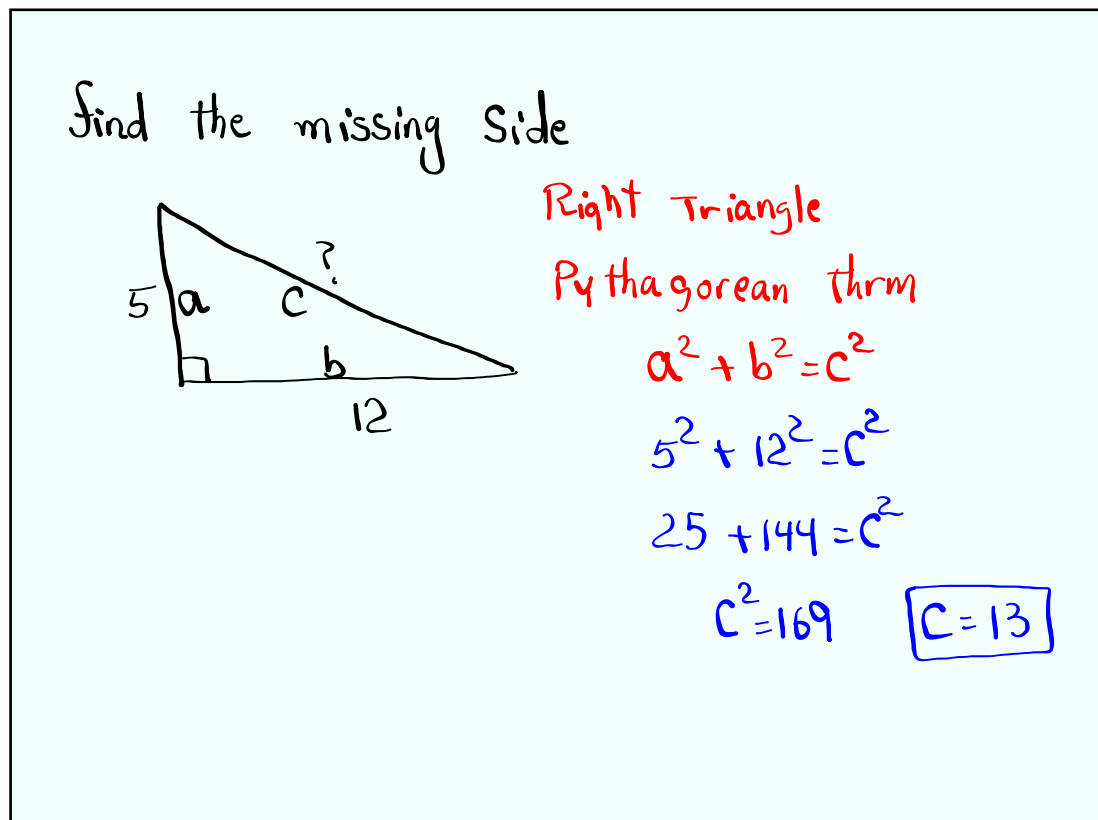
$$y = mx + b$$

$$y = \frac{2}{5}x + 2$$

Aug 29-10:34 AM



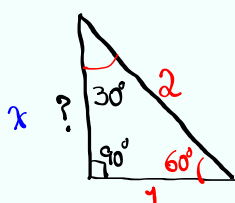
Aug 29-10:38 AM



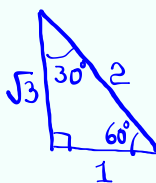
Aug 29-10:42 AM

### Special Right Triangle

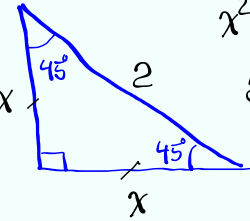
$30^\circ - 60^\circ - 90^\circ$



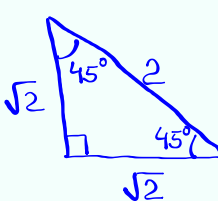
$x^2 + 1^2 = 2^2$   
 $x^2 + 1 = 4$   
 $x^2 = 3$   
 $x = \sqrt{3}$



$45^\circ - 45^\circ - 90^\circ$



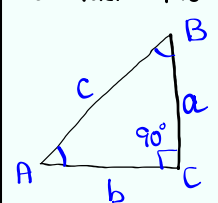
$x^2 + x^2 = 2^2$   
 $2x^2 = 4$   
 $x^2 = 2$   
 $x = \sqrt{2}$



Aug 29-10:45 AM

### Intro to Trig. :

Consider the right-Triangle ABC

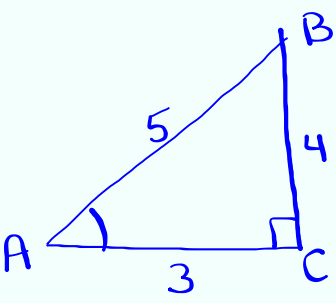


Six Trig. Functions

Sin (Sine)	Csc (Cosecant)
cos (Cosine)	Sec (Secant)
tan (tangent)	Cot (cotangent)

$\sin A = \frac{\text{opp.}}{\text{Hyp.}} = \frac{a}{c}$        $\csc A = \frac{c}{a}$   
 $\cos A = \frac{\text{adj.}}{\text{Hyp.}} = \frac{b}{c}$        $\sec A = \frac{c}{b}$   
 $\tan A = \frac{\text{opp.}}{\text{Adj.}} = \frac{a}{b}$        $\cot A = \frac{b}{a}$

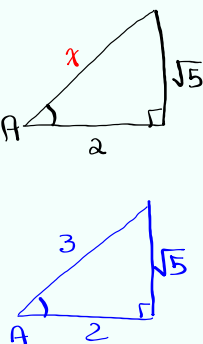
Aug 29-10:51 AM



$3^2 + 4^2 = 5^2$   
 $9 + 16 = 25$   
 $25 = 25 \checkmark$

$\sin A = \frac{O}{H} = \frac{4}{5}$        $\csc A = \frac{5}{4}$   
 $\cos A = \frac{A}{H} = \frac{3}{5}$        $\sec A = \frac{5}{3}$   
 $\tan A = \frac{O}{A} = \frac{4}{3}$        $\cot A = \frac{3}{4}$

Aug 29-10:57 AM



1) Find the Hypotenuse.

$2^2 + (\sqrt{5})^2 = x^2$   
 $4 + 5 = x^2$      $x^2 = 9$      $x = 3$

$\sin A = \frac{\sqrt{5}}{3}$        $\csc A = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$   
 $\cos A = \frac{2}{3}$        $\sec A = \frac{3}{2}$   
 $\tan A = \frac{\sqrt{5}}{2}$        $\cot A = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$

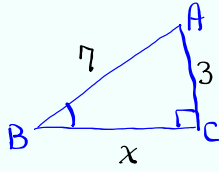
**They need to be rationalised**

$\frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{3\sqrt{5}}{\sqrt{25}} = \frac{3\sqrt{5}}{5}$   
 $\frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{2\sqrt{5}}{\sqrt{25}} = \frac{2\sqrt{5}}{5}$

Aug 29-11:01 AM

In right-Triangle ABC,  $\sin B = \frac{3}{7}$

1) Draw ABC, clearly label all three sides & all three angles.

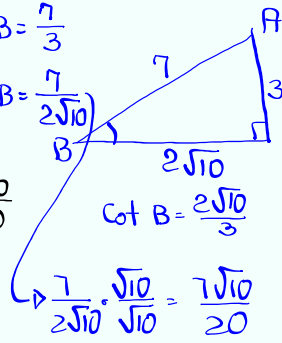


$$x^2 + 3^2 = 7^2$$

$$x^2 + 9 = 49$$

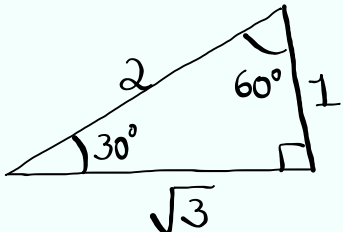
$$x^2 = 40 \quad x = \sqrt{40} = \sqrt{4} \sqrt{10} = 2\sqrt{10}$$

$\sin B = \frac{3}{7}$        $\csc B = \frac{7}{3}$   
 $\cos B = \frac{2\sqrt{10}}{7}$        $\sec B = \frac{7}{2\sqrt{10}}$   
 $\tan B = \frac{3}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{3\sqrt{10}}{20}$        $\cot B = \frac{2\sqrt{10}}{3}$   
 $\frac{7}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{7\sqrt{10}}{20}$



Aug 29-11:10 AM

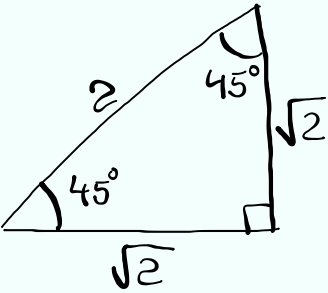
$30^\circ - 60^\circ - 90^\circ$



$\sin 30^\circ = \frac{1}{2}$        $\csc 30^\circ = 2$   
 $\cos 30^\circ = \frac{\sqrt{3}}{2}$        $\sec 30^\circ = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$   
 $\tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$        $\cot 30^\circ = \sqrt{3}$   
 $\csc 60^\circ = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$   
 $\sec 60^\circ = 2$   
 $\tan 60^\circ = \sqrt{3}$        $\cot 60^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

Aug 29-11:18 AM

$45^\circ - 45^\circ - 90^\circ$



$\sin 45^\circ = \frac{\sqrt{2}}{2}$        $\csc 45^\circ = \frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \sqrt{2}$   
 $\cos 45^\circ = \frac{\sqrt{2}}{2}$        $\sec 45^\circ = \sqrt{2}$   
 $\tan 45^\circ = 1$        $\cot 45^\circ = 1$

Aug 29-11:25 AM

Class QZ 1

use quadratic formula  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

to solve  $x^2 - 2x - 15 = 0$ .       $b^2 - 4ac =$

$\begin{matrix} \uparrow & \uparrow & \uparrow \\ a=1 & b=-2 & c=-15 \end{matrix}$ 
 $(-2)^2 - 4(1)(-15) =$   
 $4 + 60 = 64$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-2) \pm \sqrt{64}}{2(1)} = \frac{2 \pm 8}{2}$

$x = \frac{2+8}{2} = 5$ ,  $x = \frac{2-8}{2} = -3 \Rightarrow \{ -3, 5 \}$

Aug 29-11:30 AM