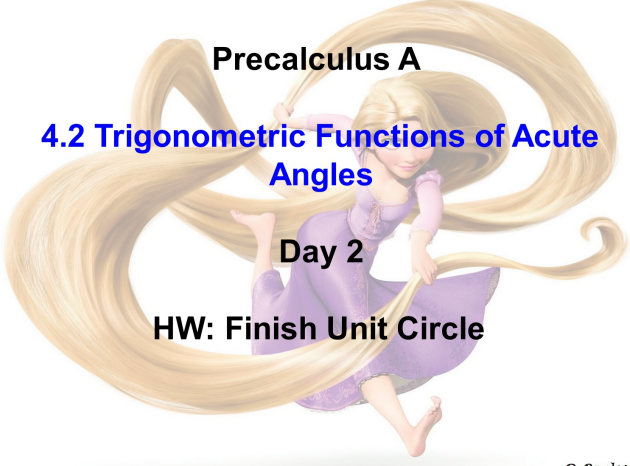


Precalculus A

4.2 Trigonometric Functions of Acute Angles

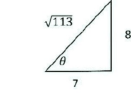
Day 2

HW: Finish Unit Circle

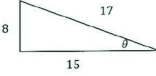


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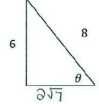
In exercises 1-4 find the values of all six trig functions of the angle θ .

1. 

$\sin \theta = \frac{8}{\sqrt{113}} = \frac{8\sqrt{113}}{113}$	$\csc \theta = \frac{\sqrt{113}}{8}$
$\cos \theta = \frac{7}{\sqrt{113}} = \frac{7\sqrt{113}}{113}$	$\sec \theta = \frac{\sqrt{113}}{7}$
$\tan \theta = \frac{8}{7}$	$\cot \theta = \frac{7}{8}$


2. 

$\sin \theta = \frac{8}{17}$	$\csc \theta = \frac{17}{8}$
$\cos \theta = \frac{15}{17}$	$\sec \theta = \frac{17}{15}$
$\tan \theta = \frac{8}{15}$	$\cot \theta = \frac{15}{8}$

3. 

$6^2 + x^2 = 8^2$
 $36 + x^2 = 64$
 $x^2 = 28$
 $x = \sqrt{28}$
 $x = 2\sqrt{7}$

$\sin \theta = \frac{6}{8} = \frac{3}{4}$	$\csc \theta = \frac{8}{6} = \frac{4}{3}$
$\cos \theta = \frac{2\sqrt{7}}{8} = \frac{\sqrt{7}}{4}$	$\sec \theta = \frac{4}{\sqrt{7}} = \frac{4\sqrt{7}}{7}$
$\tan \theta = \frac{6}{2\sqrt{7}} = \frac{3\sqrt{7}}{7}$	$\cot \theta = \frac{2\sqrt{7}}{6} = \frac{\sqrt{7}}{3}$

4. 

$9^2 + x^2 = 13^2$
 $81 + x^2 = 169$
 $x^2 = 88$
 $x = \sqrt{88}$
 $x = 2\sqrt{22}$

$\sin \theta = \frac{2\sqrt{22}}{13}$	$\csc \theta = \frac{13}{2\sqrt{22}} = \frac{13\sqrt{22}}{44}$
$\cos \theta = \frac{9}{13}$	$\sec \theta = \frac{13}{9}$
$\tan \theta = \frac{2\sqrt{22}}{9}$	$\cot \theta = \frac{9}{2\sqrt{22}} = \frac{9\sqrt{22}}{44}$

5. $\sin \theta = \frac{2}{3}$

$4 + x^2 = 9$
 $x = \sqrt{5}$
 $\sin \theta = X$
 $\csc \theta = \frac{3}{2}$
 $\cos \theta = \frac{\sqrt{5}}{3}$
 $\sec \theta = \frac{3}{\sqrt{5}} = \frac{3\sqrt{5}}{5}$
 $\tan \theta = \frac{2}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$
 $\cot \theta = \frac{\sqrt{5}}{2}$

6. $\cos \theta = \frac{5}{8}$

$25 + y^2 = 64$
 $y = \sqrt{39}$
 $\sin \theta = \frac{\sqrt{39}}{8}$
 $\csc \theta = \frac{8}{\sqrt{39}} = \frac{8\sqrt{39}}{39}$
 $\cos \theta = X$
 $\sec \theta = \frac{8}{5}$
 $\tan \theta = \frac{\sqrt{39}}{5}$
 $\cot \theta = \frac{5}{\sqrt{39}} = \frac{5\sqrt{39}}{39}$

7. $\tan \theta = \frac{12}{13}$

$144 + 169 = x^2$
 $x = \sqrt{313}$
 $\sin \theta = \frac{12}{\sqrt{313}} = \frac{12\sqrt{313}}{313}$
 $\csc \theta = \frac{\sqrt{313}}{12}$
 $\cos \theta = \frac{13}{\sqrt{313}} = \frac{13\sqrt{313}}{313}$
 $\sec \theta = \frac{\sqrt{313}}{13}$
 $\tan \theta = X$
 $\cot \theta = \frac{13}{12}$

8. $\csc \theta = \frac{12}{5}$

$5^2 + x^2 = 12^2$
 $25 + x^2 = 144$
 $x^2 = 119$
 $x = \sqrt{119}$
 $\sin \theta = \frac{5}{12}$
 $\csc \theta = X$
 $\cos \theta = \frac{\sqrt{119}}{12}$
 $\sec \theta = \frac{12}{\sqrt{119}} = \frac{12\sqrt{119}}{119}$
 $\tan \theta = \frac{5}{\sqrt{119}} = \frac{5\sqrt{119}}{119}$
 $\cot \theta = \frac{\sqrt{119}}{5}$

9. $\sec \theta = \frac{17}{5}$

$5^2 + y^2 = 17^2$
 $25 + y^2 = 289$
 $y = \sqrt{264}$
 $y = 2\sqrt{66}$
 $\sin \theta = \frac{2\sqrt{66}}{17}$
 $\csc \theta = \frac{17}{2\sqrt{66}} = \frac{17\sqrt{66}}{132}$
 $\cos \theta = \frac{5}{17}$
 $\sec \theta = X$
 $\tan \theta = \frac{5}{2\sqrt{66}} = \frac{5\sqrt{66}}{132}$
 $\cot \theta = \frac{2\sqrt{66}}{5}$

10. $\tan(\theta) = 45^\circ$

In problem 10, evaluate without using a calculator.
 $\tan(\theta) = 45^\circ = 1$

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8. $\csc \theta = \frac{12}{5}$

$5^2 + x^2 = 12^2$
 $25 + x^2 = 144$
 $x^2 = 119$
 $x = \sqrt{119}$
 $\sin \theta = \frac{5}{12}$
 $\csc \theta = X$
 $\cos \theta = \frac{\sqrt{119}}{12}$
 $\sec \theta = \frac{12}{\sqrt{119}} = \frac{12\sqrt{119}}{119}$
 $\tan \theta = \frac{5}{\sqrt{119}} = \frac{5\sqrt{119}}{119}$
 $\cot \theta = \frac{\sqrt{119}}{5}$

9. $\sec \theta = \frac{17}{5}$

$5^2 + y^2 = 17^2$
 $25 + y^2 = 289$
 $y = \sqrt{264}$
 $y = 2\sqrt{66}$
 $\sin \theta = \frac{2\sqrt{66}}{17}$
 $\csc \theta = \frac{17}{2\sqrt{66}} = \frac{17\sqrt{66}}{132}$
 $\cos \theta = \frac{5}{17}$
 $\sec \theta = X$
 $\tan \theta = \frac{5}{2\sqrt{66}} = \frac{5\sqrt{66}}{132}$
 $\cot \theta = \frac{2\sqrt{66}}{5}$

10. $\tan(\theta) = 45^\circ$

In problem 10, evaluate without using a calculator.
 $\tan(\theta) = 45^\circ = 1$

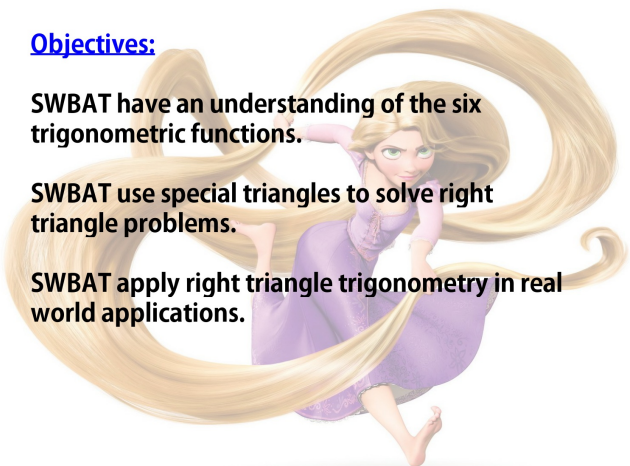
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Objectives:

SWBAT have an understanding of the six trigonometric functions.

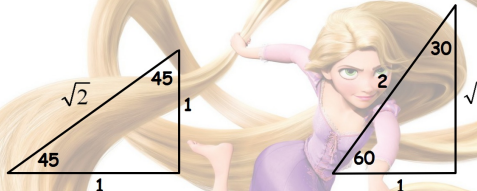
SWBAT use special triangles to solve right triangle problems.

SWBAT apply right triangle trigonometry in real world applications.

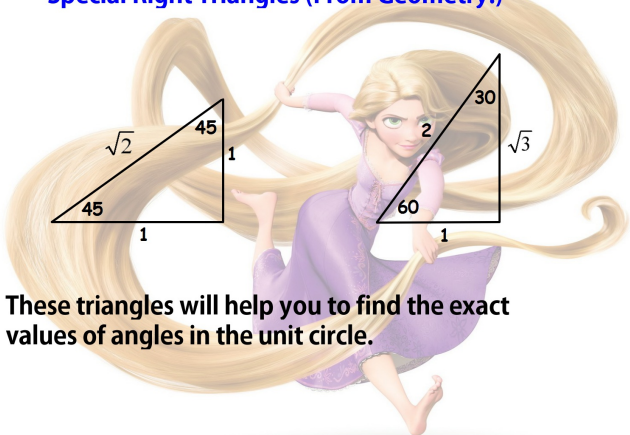


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Special Right Triangles (From Geometry!)



These triangles will help you to find the exact values of angles in the unit circle.



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Find the exact value of the following:

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

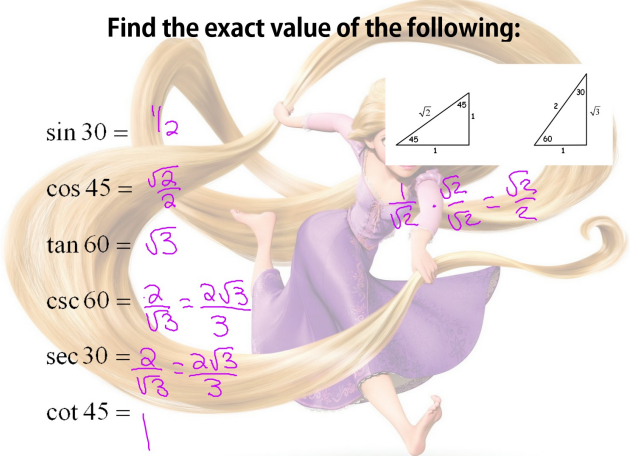
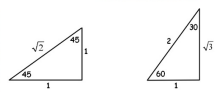
$\cos 45 = \frac{\sqrt{2}}{2}$

$\tan 60 = \sqrt{3}$

$\csc 60 = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\sec 30 = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\cot 45 = 1$



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Find the angle that makes the following ratio:

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

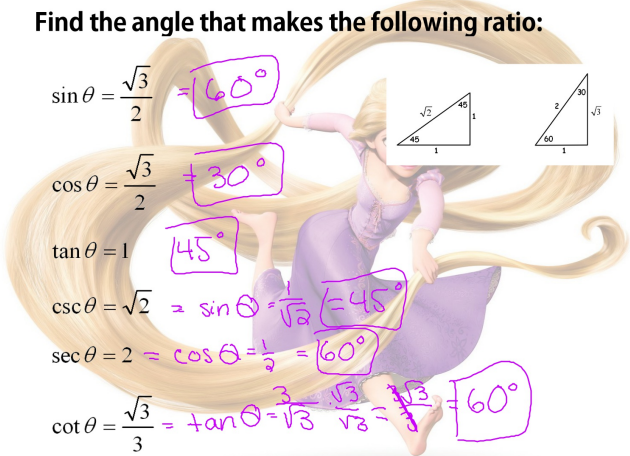
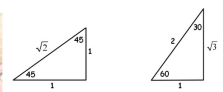
$\cos \theta = \frac{\sqrt{3}}{2} = 30^\circ$

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

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

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

$\cot \theta = \frac{\sqrt{3}}{3} = \tan \theta = \frac{3}{\sqrt{3}} = \frac{\sqrt{3}}{1} = 60^\circ$



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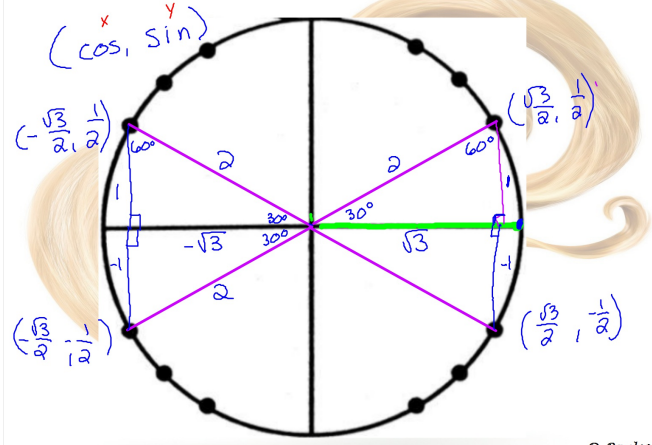
Special Angles (Make Flashcards!)

	$30^\circ = \frac{\pi}{6}$	$60^\circ = \frac{\pi}{3}$	$45^\circ = \frac{\pi}{4}$
$\sin \theta$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$
$\cos \theta$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$
$\tan \theta$	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$	1

You must memorize these! NO JOKE!!!

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Unit Circle



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