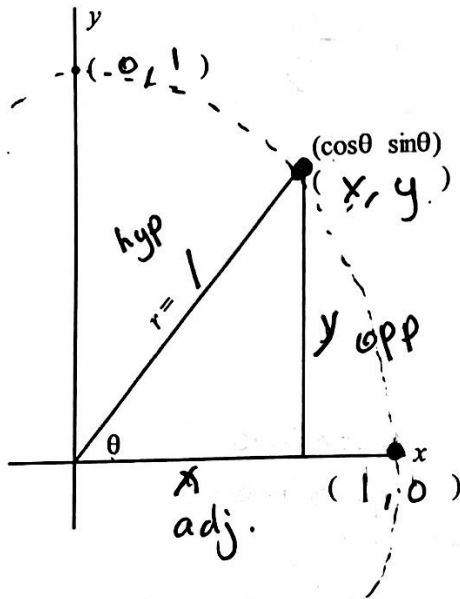


7.1/7.2 Notes – Use Unit Circle to find Trig Values

A. Find the exact value of each trig function by drawing a reference triangle.

Filled in NOTES



<p>CAH  <math>\cos \theta = \frac{x}{1} = x</math>    <math>\sec \theta = \frac{1}{x}</math> (flip cos over)</p> <p>SOH  <math>\sin \theta = \frac{y}{1} = y</math>    <math>\csc \theta = \frac{1}{y}</math> (flip sine over)</p> <p>TOA  <math>\tan \theta = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}</math>    <math>\cot \theta = \frac{x}{y} = \frac{\cos \theta}{\sin \theta}</math> (flip tan over)</p>	<p>3. <math>\tan \frac{9\pi}{2} = \tan \frac{\pi}{2} = \frac{1}{0} = \text{undefined}</math></p> <p><math>\frac{9\pi}{2} - \frac{4\pi}{2} = \frac{5\pi}{2}</math></p> <p><math>\frac{5\pi}{2} - \frac{4\pi}{2} = \frac{\pi}{2}</math></p>	<p>4. <math>\cos -\frac{7\pi}{3} = \cos \frac{5\pi}{3} = \frac{1}{2}</math></p> <p><math>-\frac{7\pi}{3} + \frac{6\pi}{3} = -\frac{\pi}{3}</math></p> <p><math>-\frac{\pi}{3} + \frac{6\pi}{3} = \frac{5\pi}{3}</math></p>
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B. Find the exact value of each trig function using the unit circle as a reference.

1.  $\sin 315^\circ = \frac{-\sqrt{2}}{2}$   
y value

2.  $\csc 750^\circ = \csc 30^\circ = 2$   
 → Find coterminal  $\angle$   
 $750 - 360 = 390$   
 $390 - 360 = 30^\circ$   
 flip y over

3.  $\cot \pi = \frac{-1}{0} = \text{undefined}$

4.  $\cos -\frac{35\pi}{6} = \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$

Find coterminal  $\angle$   
 $-\frac{35\pi}{6} + \frac{12\pi}{6} = -\frac{23\pi}{6}$   
 $-\frac{23\pi}{6} + \frac{12\pi}{6} = -\frac{11\pi}{6}$   
 $-\frac{11\pi}{6} + \frac{12\pi}{6} = \frac{\pi}{6}$

5.  $\tan -\frac{5\pi}{6} = \tan \frac{7\pi}{6}$

$-\frac{5\pi}{6} + \frac{12\pi}{6} = \frac{7\pi}{6}$   
 $\frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = +\frac{1}{2} \cdot \frac{2}{\sqrt{3}} = \frac{1 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{\sqrt{3}}{3}$

6.  $\sec 495^\circ = \sec 135^\circ =$

$495 - 360 = 135^\circ$   
 $-\frac{2 \cdot \sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = -\frac{2\sqrt{2}}{2} = -\sqrt{2}$

# SM3 7.3 Notes – Solving Trigonometric Equations

A. Warm-up: Solve each equation.

<p>1. <math>2x = -13x + 30</math>  <math>+13x +13x</math>  <math>\frac{15x}{15} = \frac{30}{15}</math> <span style="border: 1px solid black; padding: 2px;"><math>x=2</math></span></p>	<p>2. <math>14 = -4r - 4</math>  <math>+4 \quad +4</math>  <math>\frac{18}{-4} = \frac{-4r}{-4}</math> <span style="border: 1px solid black; padding: 2px;"><math>r = -\frac{9}{2}</math></span></p>

Answer in Degrees

$\frac{S}{T} \mid \frac{A}{C}$

$x = \cos \theta$

$y = \sin \theta$

$\tan \theta = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}$

B. Solve each equation for  $0 \leq \theta < 360$ . (Remember: All Students Take Calculus and  $\tan \theta = \frac{y}{x} = \frac{\sin \theta}{\cos \theta}$ )

<p>1. <math>-5 + \cos \theta = -6</math>  <math>+5 \quad +5</math> Solve for <math>\cos \theta</math>  <math>\cos \theta = -1</math> where is <math>x = -1</math>  <span style="border: 1px solid black; padding: 5px;"><math>\theta = 180^\circ</math></span></p>	<p>2. <math>4 = -8 \sin \theta</math>  <math>-8 \quad -8</math> where is <math>y</math> value <math>= -\frac{1}{2}</math>  <math>\sin \theta = -\frac{1}{2}</math>  <math>\frac{S}{T} \mid \frac{A}{C}</math>  <span style="border: 1px solid black; padding: 5px;"><math>\theta = 210^\circ, 330^\circ</math></span></p>
<p>3. <math>\frac{\sqrt{3}}{2} \tan \theta = -\frac{1}{2}</math>  <math>\frac{\sqrt{3}}{2} \div \frac{1}{2} = \frac{\sqrt{3}}{2} \cdot \frac{1}{1} = -\sqrt{3}</math>  <math>\tan \theta = -\sqrt{3}</math>  <math>120^\circ, 300^\circ</math></p>	<p>4. <math>3 + \sin \theta = 5</math>  <math>-3 \quad -3</math> <math>y</math> value <math>= 2</math>  <math>\sin \theta = 2</math>          no solution * <math>\sin</math> can never be bigger or smaller than 1 or -1</p>
<p>5. <math>\frac{\sqrt{2}}{2} \sin \theta = -\frac{\sqrt{2}}{2}</math>  <math>\frac{\sqrt{2}}{2} \div \frac{\sqrt{2}}{2} = -\frac{\sqrt{2}}{2} \div \frac{\sqrt{2}}{2} = -1</math>  <math>\sin \theta = -\frac{\sqrt{2}}{2}</math> where is <math>y</math> value <math>= -\frac{\sqrt{2}}{2}</math>  <span style="border: 1px solid black; padding: 5px;"><math>\theta = 225^\circ, 315^\circ</math></span></p>	<p>6. <math>\frac{\sqrt{3}}{2} = -2 \cos \theta</math>  <math>\frac{\sqrt{3}}{2} \div -2 = -\frac{\sqrt{3}}{4}</math>  <math>\cos \theta = -\frac{\sqrt{3}}{4}</math> where is <math>x = -\frac{\sqrt{3}}{2}</math>  <math>\frac{S}{T} \mid \frac{A}{C}</math>  <span style="border: 1px solid black; padding: 5px;"><math>\theta = 150^\circ, 210^\circ</math></span></p>

Solve each equation for  $0 \leq \theta < 2\pi$ .

Answer in Radians

1.  $\frac{5-4\tan\theta}{-5} = \frac{5}{-5}$

$\frac{4\tan\theta}{4} = \frac{0}{4}$

$\tan\theta = 0$

$\pi, 0$

$\tan\theta = \frac{y}{x}$

2.  $\frac{8\cos\theta}{8} = \frac{4\sqrt{2}}{8}$

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

where is x value

$\frac{\pi}{4}, \frac{7\pi}{4}$

3.  $\frac{-2-2\sin\theta}{+2} = \frac{-3}{+2}$

$\frac{-2\sin\theta}{-2} = \frac{-1}{-2}$

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

where is y = 1/2

$\frac{\pi}{6}, \frac{5\pi}{6}$

4.  $\frac{1-\frac{1}{4}\sin\theta}{-1} = \frac{\frac{1}{2}}{-1}$

$\frac{4}{4}\sin\theta = \frac{1}{2} + \frac{4}{4}$

$\sin\theta = \frac{5}{2} = 2.5$

No Solution

5.  $-3 + \cos\theta = \frac{-6-\sqrt{3}}{2}$

$3 + \cos\theta = \frac{-6}{2} - \frac{\sqrt{3}}{2}$

$\frac{5\pi}{6}, \frac{7\pi}{6}$

6.  $\frac{25+\sqrt{3}}{5} = 5 + \frac{2}{5}\sin\theta$

$\frac{25}{5} + \frac{\sqrt{3}}{5} = 5 + \frac{2}{5}\sin\theta$

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

$\sin\theta = \frac{\sqrt{3}}{2}$

where is y = sqrt(3)/2

$\frac{2\pi}{3}, \frac{\pi}{3}$