Warm Up

*Geo Review & Drawing WS

The unit circle diagram showing angles in degrees and radians with coordinate points:
- $(0,1)$ at $\frac{\pi}{2}$ / 90°
- $\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$, $\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$, $\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$ in first quadrant
- $\left(\frac{-1}{2}, \frac{\sqrt{3}}{2}\right)$, $\left(\frac{-\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$, $\left(\frac{-\sqrt{3}}{2}, \frac{1}{2}\right)$ in second quadrant
- $(-1,0)$ at π / 180°, $(1,0)$ at 0° / 0
- angles $\frac{2\pi}{3}$ 120°, $\frac{3\pi}{4}$ 135°, $\frac{5\pi}{6}$ 150°, $\frac{\pi}{3}$ 60°, $\frac{\pi}{4}$ 45°, $\frac{\pi}{6}$ 30°
- $\frac{7\pi}{6}$ 210°, 225°, $\frac{5\pi}{4}$ 240°, $\frac{4\pi}{3}$, 270°, 315° $\frac{7\pi}{4}$, 300° $\frac{5\pi}{3}$, 330° $\frac{11\pi}{6}$
- $\frac{3\pi}{2}$, $(0,-1)$
- $\left(\frac{-\sqrt{3}}{2}, \frac{-1}{2}\right)$, $\left(\frac{-\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$, $\left(\frac{-1}{2}, \frac{-\sqrt{3}}{2}\right)$, $\left(\frac{1}{2}, \frac{-\sqrt{3}}{2}\right)$, $\left(\frac{\sqrt{2}}{2}, \frac{-\sqrt{2}}{2}\right)$, $\left(\frac{\sqrt{3}}{2}, \frac{-1}{2}\right)$

Examples: Find the reference angle for the following:
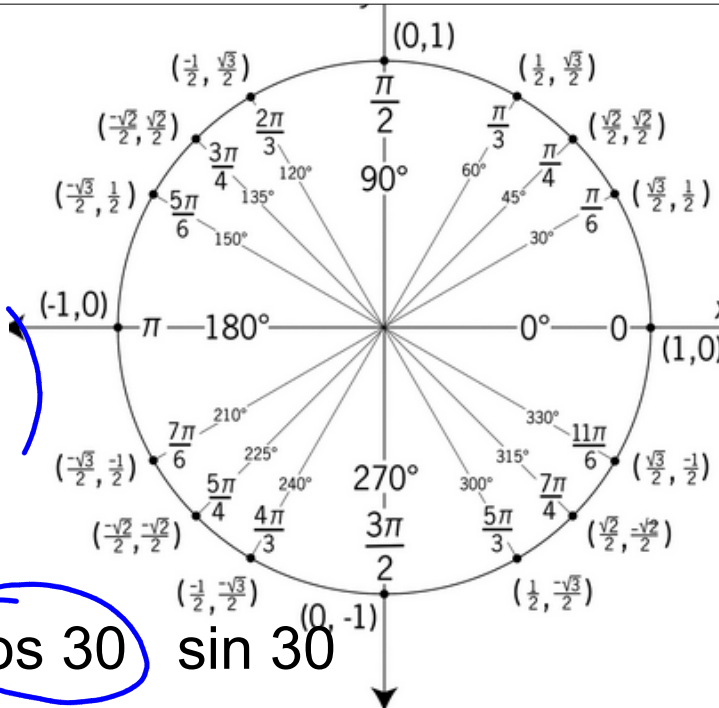
a) $\sin \dfrac{4\pi}{3}$ b) $\tan \dfrac{7\pi}{4}$

Helpful Hint for Reference Angles

Helpful Hint

$$\left(\frac{\sqrt{\#}}{2},\frac{\sqrt{\#}}{2}\right)$$
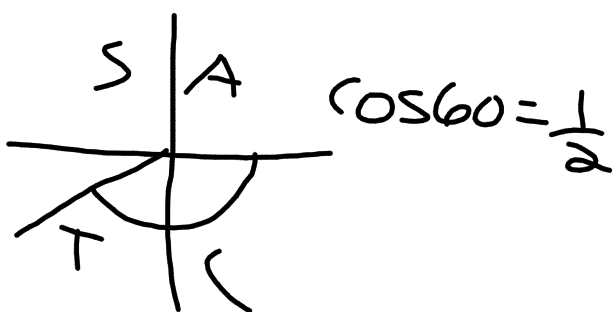
$$\left(\frac{\sqrt{3}}{2},\frac{\sqrt{1}}{2}\right)$$

*Find the following:

A) cos 0   sin 0   B) cos 30   sin 30

C) cos 45 sin 45 D) cos 60 sin 60

E) cos 90 sin 90

$$\cos\left(-\frac{2\pi}{3}\right) = \boxed{-\frac{1}{2}}$$

S | A

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

T | C

Steps to evaluating any angle:

1) Find the reference angle.

2) Evaluate reference angle.

   (Might need to draw a triangle)

3) Is it positive or negative?

(All Students Take Calculus)

4) Put it all together!

Evaluating Angles

1) cos 315°   2) csc 240°

3) sin $\dfrac{-2\pi}{3}$ 4) tan 210°

① $\tan 510° = -\dfrac{\sqrt{3}}{3}$
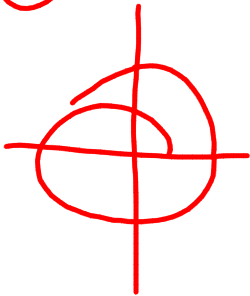
$\tan 30 = \dfrac{\sin 30}{\cos 30} = \dfrac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} \cdot \dfrac{\cancel{2}}{\sqrt{3}} = \dfrac{1}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \dfrac{\sqrt{3}}{3}$

Evaluating Angles Quiz Practice

*flash cards

Homework

⭐ Evaluating Angles Quiz on _Tuesday_ ! ⭐

Set Up

1) Solve each equation by factoring.

  a) $x^2 + 7x + 15 = 5$ b) $x^2 + 8x = -15$

$$x^2 + 7x + 10 = 0 \qquad -5 - 5$$

$$(x+5)(x+2) = 0 \qquad +15 +15$$

$$x^2 + 8x + 15 = 0$$

2) When does the cos x=0? $(x+3)(x+5) = 0$

(-1, 0) $90° , 270°$ $x = -3, -5$

(1, 1) $\frac{\pi}{2} , \frac{3\pi}{2}$

(1, -1)

3) When does the sinx= 1/2

$$30° , 150°$$

$$\begin{array}{c|c} S & A \\ \hline T & C \end{array}$$
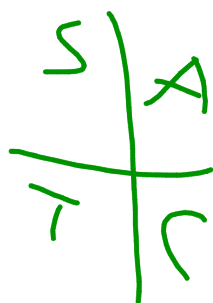
Solving Trigonometric Functions

Find all the solutions.

a) $\sin(\theta) = (-1/2)$ b) $\cos(\theta) = -1$

210°, 330°

180°

(0,1)

(-1,0)   (1,0)

(0,-1)

S | A

T | C

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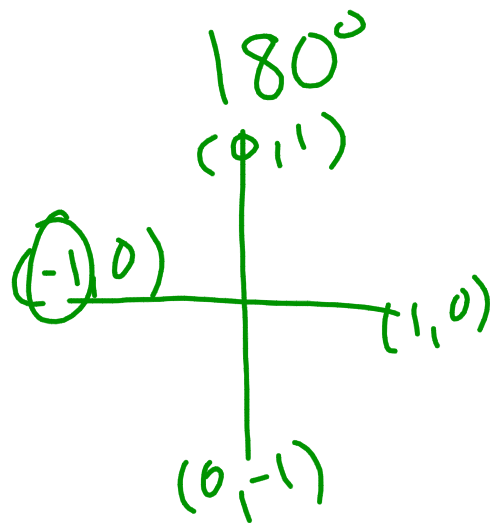
Interval Notation

Find all the solutions.

a) $\sin(\theta) = 1$ b) $\cos(\theta) = (-1/2)$

Jan 28-2:02 PM

Solving Trigonometric Functions

Solve the following for $0 \leq x < 2\pi$.

A) $\sin(x) + 2 = 3$.

B) $\tan^2(x) - 3 = 0$

C) $2\cos^2(x) - \sqrt{3}\cos(x) = 0$

TOYO   Solving Trigonometric Functions

Solve the following for $0 \le x < 2\pi$.
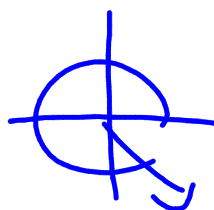 A) $2 \cos (x) + 1 = 3$

Solve the following for $0 \le x < 2\pi$.
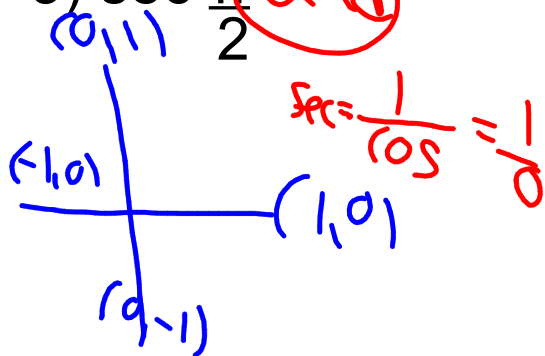
  B) $4 \sin^2 x = 3$

Warm Up

1) sin (60)=

$$\frac{\sqrt{3}}{2}$$

2) sin (315)= $-\frac{\sqrt{2}}{2}$

Sin45=$\frac{\sqrt{2}}{2}$

3) sec $\frac{\pi}{2}$ und

(0,1)

(-1,0)

(1,0)

(0,-1)

sec=$\frac{1}{cos}=\frac{1}{0}$

4) tan (60)= $\sqrt{3}$

$$\frac{sin60}{cos60} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} \cdot \frac{2}{1}$$

Feb 14-7:19 PM

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General Solution

$$2 \sin x - \sqrt{3} = 0$$

$$+\sqrt{3} \quad +\sqrt{3}$$

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

S | A
—————
T | C

y= sin x is periodic

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

$$60, 120$$

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

x= π/3 + 2nπ   x= 2π/3 + 2nπ

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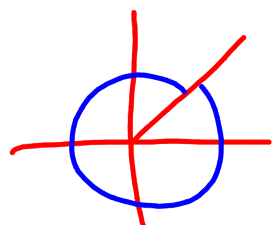
TOYO

1) Find the general solution of the equation

2 sin x +4 =5.

$-4 \quad -4$

$\dfrac{2\sin x}{2} = \dfrac{1}{2}$

$\sin x = \dfrac{1}{2}$

S | A
—————
T | C

$\dfrac{\pi}{6} + 2n\pi \qquad \dfrac{5\pi}{6} + 2n\pi$

http://themetapicture.com/this-should-be-the-first-thing-shown-in-all-trigonometry-classes/
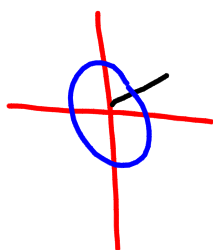
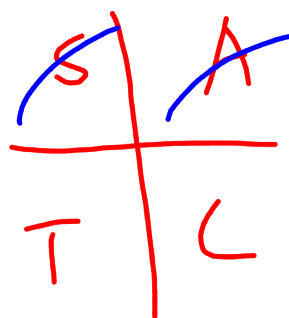*What is the best way to communicate with a fish?

Drop them a line

Solving Trigonometric Functions

Solve the following for $0 \le x < 2\pi$.

A) $\sin x + \sqrt{2} = -\sin x$

$-\sin x \qquad -\sin x$

$\dfrac{\sqrt{2}}{-2} = \dfrac{-2 \cdot \sin x}{-2}$

$\dfrac{-\sqrt{2}}{2} = \sin x$

$225 \qquad 315$

$\dfrac{5\pi}{4} \qquad \dfrac{7\pi}{4}$

S	A
T	C

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Solving Trigonometric Functions

Solve the following for $0 \leq x < 2\pi$.

A) $\cos^2(x) + 2\cos(x) = -1$

$x^2 + 2x = -1$

$\cos^2(x) + 2\cos(x) + 1 = 0$
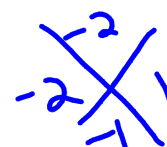$\qquad\quad +1 \qquad +1$

$(\cos x + 1)(\cos x + 1) = 0$

$\cos x + 1 = 0$
$\quad\;\; -1 \;\; -1$

$\cos x = -1 \qquad 180° \text{ or } \pi$

$\dfrac{-2}{-2} \diagdown \dfrac{1}{-1}$

B) $2\sin^2 x - \sin x - 1 = 0$

$(2\sin x + 1)(\sin x - 1) = 0$

$2\sin x + 1 = 0 \qquad \sin x - 1 = 0$

$\sin x = -\dfrac{1}{2} \qquad \sin x = 1$

$210°, 330° \qquad 90° \text{ or } \dfrac{\pi}{2}$

$2x^2 - x - 1 = 0$

$(2x^2 - 2x) + (1x - 1) = 0$

$2x(x-1) + 1(x-1) = 0$

$(2x+1)(x-1) = 0$

$\begin{array}{c|c} S & A \\ \hline T & C \end{array}$

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TOYO　Solving Trigonometric Functions

Solve the following for $0 \leq x < 2\pi$.

A) $2\sin^3 x = \sin x$

$-\sin x \quad -\sin x$

$2\sin^3 x - \sin x = 0$

$\sin x (2\sin^2 x - 1) = 0$

$\sin x = 0$　　　$2\sin^2 x - 1 = 0$

$0°, 180°$　　　　　$+1 \quad +1$

　　　　　　$\dfrac{2\sin^2 x}{2} = \dfrac{1}{2}$

　　　　　　$\sin^2 x = \sqrt{\dfrac{1}{2}}$

　　　　　$\sin = \dfrac{1}{\sqrt{2}}\dfrac{\sqrt{2}}{\sqrt{2}} = \dfrac{\pm\sqrt{2}}{2}$

Solve the following for $0 \leq x < 2\pi$

B) $\sin^2 x + 5\sin x + 4 = 0$

$45, 135, 225, 315$

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Homework
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