

PAGE 584

1) $\frac{\pi}{6}, \frac{11\pi}{6}$

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

3) $\frac{2\pi}{3}, \frac{5\pi}{3}$

30) $0, \pi$

9) 1.712, 4.571

33) $\frac{3\pi}{4}, \frac{7\pi}{4}$

16) 0

GHW#13 Due Friday. Reschedule before Friday if you're not going to be here and get Friday's note sheet. Otherwise you will take the quiz Monday when you return.

After checking hw, try the warmup in our notes.

Assignment sheet is a day off.

Jan 19-3:51 PM

PAGE 584

1) $\frac{\pi}{6}, \frac{11\pi}{6}$

3) $\frac{2\pi}{3}, \frac{5\pi}{3}$

9) 1.712, 4.5712

16) 0

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

30) $0, \pi$

33) $\frac{3\pi}{4}, \frac{7\pi}{4}$

30) $\tan x \sin x - \tan x = 0$
 $\tan x (\sin x - 1) = 0$
 $\tan x = 0 \mid \sin x = 1$
 $x = 0, \pi, 2\pi$
 $\frac{\pi}{2}$ undefined

9) $2 \cos x - 1 = -1.2814$
 $\frac{2 \cos x}{2} = \frac{-1.2814}{2}$
 $\cos x = -0.6407, \alpha = \cos^{-1}(-0.6407) = 1.10716..$
 $\frac{\pi}{2}:$
 $\frac{3\pi}{2}:$

33) $2 \sec x \tan x + 2 \sec x + \tan x + 1 = 0$
 $2 \sec x (\tan x + 1) + 1 (\tan x + 1) = 0$
 $(\tan x + 1)(2 \sec x + 1) = 0$
 $\tan x = -1 \mid \sec x = -\frac{1}{2}$
 $x = \frac{3\pi}{4} \mid \cos x = -2$
 Impossible
 $\text{II: } x = \frac{3\pi}{4}$
 $\text{IV: } x = \frac{7\pi}{4}$
 $x = \frac{7\pi}{4}$

Jan 19-3:51 PM

Trig Equations using the quadratic formula:

Review:Solve for x between $[0, 2\pi)$:

$$2 \tan^2 x - 1 = -\tan x$$

$$2 \tan^2 x + \tan x - 1 = 0$$

$$2 \tan^2 x + 2 \tan x - \tan x - 1 = 0$$

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

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

$$\tan x = -1$$

$$\alpha = \pi/4$$

$$\text{II: } X = \pi - \frac{\pi}{4} = \frac{3\pi}{4}$$

$$\text{IV: } X = 2\pi - \frac{\pi}{4} = \frac{7\pi}{4}$$

$$\tan x = 1/2, \alpha = \tan^{-1}(.5) = .4636476$$

$$\text{I: } X = .4636$$

$$\text{III: } X = \pi + \alpha = 3.6052$$

$$\left\{ \frac{3\pi}{4}, \frac{7\pi}{4}, .4636, 3.6052 \right\}$$

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

$$p = -2, s = 1$$

$$-1, 2$$

Jan 19-8:49 AM

Solve each below between $[0, 2\pi)$

1. $2 \tan^2 x - 1 = 3 \tan x$

$$2 \tan^2 x - 3 \tan x - 1 = 0$$

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

$$\tan x = \frac{-(-3) \pm \sqrt{9 - 4(2)(-1)}}{2(2)} = \frac{3 \pm \sqrt{9+8}}{4} = \frac{3 \pm \sqrt{17}}{4}$$

$$\tan x = \frac{(3+\sqrt{17})}{4} = 1.7807 \dots \quad \tan x = \frac{(3-\sqrt{17})}{4} = -.280776 \dots$$

$$\alpha = \tan^{-1}(\text{2nd Ans})$$

$$\alpha = 1.0591 \dots$$

$$\text{QI: } X = 1.059$$

$$\text{QIII: } X = \pi + \alpha$$

$$X = 4.201$$

$$\alpha = \tan^{-1}(-\text{2nd Ans})$$

$$\alpha = .27372 \dots$$

$$\text{QII: } X = \pi - \alpha = 2.868$$

$$\text{QIV: } X = 2\pi - \alpha = 6.009$$

$$\left\{ 1.059, 4.201, 2.868, 6.009 \right\}$$

$$2x^2 - 3x - 1 = 0$$

$$p = -2, s = -3$$

$$-1, -2$$

$$1.57$$

$$3.14$$

$$6.28$$

$$4.71$$

Jan 19-8:50 AM

2. $2 \cos^2 \theta = 5 \cos \theta + 1$

$2 \cos^2 \theta - 5 \cos \theta - 1 = 0$

$$\cos \theta = \frac{-(-5) \pm \sqrt{25 - 4(2)(-1)}}{2(2)} = \frac{5 \pm \sqrt{25+8}}{4} = \frac{5 \pm \sqrt{33}}{4}$$

$$\cos \theta = \frac{5 + \sqrt{33}}{4} = 2.686 \dots$$

$-1 \leq \cos \theta \leq 1$
impossible
reject

$$\cos \theta = \frac{5 - \sqrt{33}}{4} = -0.1861$$

$\alpha = \cos^{-1}(-2^{\text{nd}} \text{ Ans})$

$\alpha = 1.38356$

II: $X = \pi - \alpha = 1.758$

III: $X = \pi + \alpha = 4.525$

$\{1.758, 4.525\}$

Jan 19-8:50 AM

3. $3 \sin^2 x = 3 \sin x + 2$

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

$$\sin x = \frac{-(-3) \pm \sqrt{9 - 4(3)(-2)}}{2(3)} = \frac{3 \pm \sqrt{9+24}}{6} = \frac{3 \pm \sqrt{33}}{6}$$

$$\sin x = \frac{3 + \sqrt{33}}{6} = 1.4574$$

$\alpha = \text{impossible}$

$-1 \leq \sin x \leq 1$
reject

$$\sin x = \frac{3 - \sqrt{33}}{6} = -0.457427$$

$\alpha = \sin^{-1}(-2^{\text{nd}} \text{ Ans})$

III: $X = \pi + \alpha$

IV: $X = 2\pi - \alpha$

$\{3.6167, 5.8081\}$

Jan 19-8:50 AM

4. $\csc^2 x - 6\csc x + 4 = 0$

$$\csc x = \frac{-(-6) \pm \sqrt{36 - 4(1)(4)}}{2(1)} = \frac{6 \pm \sqrt{36 - 16}}{2} = \frac{6 \pm \sqrt{20}}{2}$$

$$\sin x = \frac{2}{(6 \pm \sqrt{20})} +$$

$$\sin x = \frac{2}{(6 + \sqrt{20})} = .19098 \quad \sin x = \frac{2}{(6 - \sqrt{20})} = 1.309...$$

$$\alpha = \sin^{-1}(\text{2nd}) = .19216$$

$$\text{I: } x = .192$$

$$\text{II: } x = \pi - \alpha = 2.949$$

$$\{.192, 2.949\}$$

$$\alpha = \sin^{-1}(\text{2nd Ans}) = \text{error}$$

$$-1 \leq \sin x \leq 1$$

reject

Jan 19-8:50 AM

Feb 4-10:45 PM