Interest meeting for American Sign Language Club this Thursday, May 1, 2:30pm in C310

going over solving equations worksheet

18. $(\tan 3x)(\tan x - 1) = 0$

$[0, 2\pi)$

$[0, \frac{6\pi}{3})$

$\tan 3x = 0$

$3x = 0\pi + 2\pi n$

$x = 0 + \frac{2\pi n}{3}$

$3x = \pi + 2\pi n$

$x = \frac{\pi}{3} + \frac{2\pi n}{3}$

| n | $\frac{2\pi n}{3}$ | $\frac{\pi + 2\pi n}{3}$ |
|---|---|---|
| 0 | 0 | $\pi/3$ |
| 1 | $\frac{2\pi}{3}$ | $\pi$ |
| 2 | $\frac{4\pi}{3}$ | $\frac{5\pi}{3}$ |
| | $\frac{\pi}{4}$ | $\frac{5\pi}{4}$ |

$\tan x - 1 = 0$

$\tan x = 1$

$x = \frac{\pi}{4}$ $x = \frac{5\pi}{4}$

28. $\sin(2x) = -\frac{\sqrt{3}}{2}$

$2x = \frac{4\pi}{3} + 2\pi n$ $\qquad$ $2x = \frac{5\pi}{3} + 2\pi n$

$x = \frac{2\pi}{3} + \pi n$ $\qquad$ $x = \frac{5\pi}{6} + \pi n$

31. $\cos\left(\frac{x}{2}\right) = \frac{\sqrt{2}}{2}$

$\frac{x}{2} = \frac{\pi}{4} + 2\pi n$ $\qquad$ $\frac{x}{2} = \frac{7\pi}{4} + 2\pi n$

$x = \frac{\pi}{2} + 4\pi n$ $\qquad$ $x = \frac{7\pi}{2} + 4\pi n$

30. $\tan 3x = 0$

$3x = 0 + 2\pi n$ $\qquad$ $3x = \pi + 2\pi n$

$x = \frac{2\pi n}{3}$ $\qquad$ $x = \frac{\pi}{3} + \frac{2\pi n}{3}$

$3x = 2\pi + 2\pi n$

$x = \frac{2\pi}{3} + \frac{2\pi n}{3}$

13. $2\sin^2(2x) = 1$

$\sqrt{\sin^2(2x)} = \sqrt{\frac{1}{2}}$ $\quad \frac{\sqrt{1}}{\sqrt{2}} \pm \frac{1}{\sqrt{2}}$

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

$2x = \frac{\pi}{4} + 2\pi n$

$x = \frac{\pi}{8} + \frac{8\pi n}{8}$

$2x = \frac{3\pi}{4} + 2\pi n$

$x = \frac{3\pi}{8} + \frac{8\pi n}{8}$

$2x = \frac{5\pi}{4} + 2\pi n$

$x = \frac{5\pi}{8} + \frac{8\pi n}{8}$

$2x = \frac{7\pi}{4} + 2\pi n$

$x = \frac{7\pi}{8} + \frac{8\pi n}{8}$

| n | $\frac{\pi + 8\pi n}{8}$ | $\frac{3\pi + 8\pi n}{8}$ | $\frac{5\pi + 8\pi n}{8}$ | $\frac{7\pi + 8\pi n}{8}$ |
|---|---|---|---|---|
| 0 | $\pi/8$ | $3\pi/8$ | $5\pi/8$ | $7\pi/8$ |
| 1 | $9\pi/8$ | $11\pi/8$ | $13\pi/8$ | $15\pi/8$ |
| | | | | |

3. $3(\tan 2x)^2 - 1 = 0$

$x = \frac{\pi}{12}$ $x = \frac{5\pi}{12}$

$3\left(\tan\left(\frac{\pi}{12} \cdot 2\right)\right)^2 - 1 = 0$

$3\left(\frac{1}{\sqrt{3}}\right)^2 - 1$

$1 - 1 = 0$ ✓

$3\left(\tan \frac{2 \cdot 5\pi}{12_6}\right)^2 - 1 = 0$

$3\left(-\frac{1}{\sqrt{3}}\right)^2 - 1 = 0$

$\frac{3}{3} - 1 = 0$

$0 = 0$ ✓

32. $\sec(4x) = 2$

$\cos(4x) = \frac{1}{2}$

$4x = \frac{\pi}{3} + 2\pi n$ $\quad$ $4x = \frac{5\pi}{3} + 2\pi n$

$x = \frac{\pi}{12} + \frac{\pi n}{2}$ $\quad$ $x = \frac{5\pi}{12} + \frac{\pi n}{2}$

1. $2\cos x - 1 = 0$

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

$$x = \frac{\pi}{3} + 2\pi n$$

$$x = \frac{5\pi}{3} + 2\pi n$$

next slides are practice of the odd problems (1-19) on the trig identity worksheet

1. $\cos x(\sec x - \cos x) = \sin^2 x$

$\cos x \sec x - \cos^2 x = \sin^2 x$

$\cos x \cdot \frac{1}{\cos x} - \cos^2 x = \sin^2 x$

$1 - \cos^2 x = \sin^2 x$

$\sin^2 x = \sin^2 x$ ✓

3. $\sin x(\csc x - \sin x) = \cos^2 x$

$\sin x \csc x - \sin^2 x = \cos^2 x$

$\sin x \cdot \frac{1}{\sin x} - \sin^2 x = \cos^2 x$

$1 - \sin^2 x = \cos^2 x$

$\cos^2 x = \cos^2 x$ ✓

5. $\sin^2 x - \sin^2 x \csc^2 x = -\cos^2 x$

$\sin^2 x - \sin^2 x \cdot \frac{1}{\sin^2 x} = -\cos^2 x$

$\sin^2 x - 1 = -\cos^2 x$

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

$-\cos^2 x = -\cos^2 x$ ✓

7. $(\sec\theta + 1)(\sec\theta - 1) = \tan^2\theta$

$\sec^2\theta - 1 = \tan^2\theta$

$(1 + \tan^2\theta) - 1 = \tan^2\theta$

$\tan^2\theta = \tan^2\theta$ ✓

9. $\sec^2 A + \tan^2 A \sec^2 A = \sec^4 A$

$\sec^2 x (1 + \tan^2 x) = \sec^4 x$

$\sec^2 x \cdot \sec^2 x = \sec^4 x$

$\sec^4 x = \sec^4 x$

11. $\cos^4 t - \sin^4 t = 1 - 2\sin^2 t$

$(\cos^2 x - \sin^2 x)(\cos^2 x + \sin^2 x)$

$(\cos^2 x - \sin^2 x)\ 1$

$1 - \sin^2 x - \sin^2 x$

$1 - 2\sin^2 x$

13. $\dfrac{1}{\sin x \cos x} - \dfrac{\cos x}{\sin x \cos x} = \tan x$

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

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

$\dfrac{\sin x}{\cos x}$

$\tan x =$

15. $\dfrac{\sin x}{\csc x}+\dfrac{\cos x}{\sec x}=1$

$\sin x \cdot \dfrac{1}{\csc x} + \cos x \cdot \dfrac{1}{\sec x} = 1$

$\sin x \cdot \sin x + \cos x \cdot \cos x = 1$

$\sin^2 x + \cos^2 x = 1$

$1 = 1$ ✓

17. $\dfrac{(1-\cos s)1}{(1-\cos s)(1+\cos s)} = \csc^2 s - \csc s \cot s$

$\dfrac{1-\cos x}{1-\cos^2 x}$

$\dfrac{1}{1}\cdot\dfrac{1-\cos x}{\sin^2 x}$

$\dfrac{1}{\sin^2 x} - \dfrac{\cos x}{\sin^3 x}$

$\csc^2 x - \dfrac{\cos x}{\sin x}\cdot\dfrac{1}{\sin x}$

$\csc^2 x - \cot x \cdot \csc x$

19. $\dfrac{\tan^2 x \cos x}{(\sec x - 1)} - \dfrac{\cos x(\sec x - 1)}{(\tan^2 x)(\sec x - 1)} = \cot^2 x$

$\dfrac{\tan^2 x \cos x - \cos x \sec x + \cos x}{\tan^2 x(\sec x - 1)}$

$\dfrac{\dfrac{\sin^2 x}{\cos x}\cos x - \cos x \cdot \dfrac{1}{\cos x} + \cos x}{\tan^2 x(\sec x - 1)}$

$\dfrac{\dfrac{\sin^2 x}{\cos x} - \dfrac{\cos x}{\cos x} + \dfrac{\cos x \cos x}{\cos x}}{\tan^2 x(\sec x - 1)} = \cot^2 x$

$\dfrac{\dfrac{\sin^2 x - \cos x + \cos^2 x}{\cos x}}{\tan^2 x(\sec x - 1)} =$

$\dfrac{\dfrac{1-\cos x}{\cos x}}{\dfrac{\sin^2 x}{\cos^2 x}\left(\dfrac{1}{\cos x} - \dfrac{\cos x}{\cos x}\right)} = \cot^2 x$

$\dfrac{\dfrac{1-\cos x}{\cos x}}{\dfrac{\sin^2 x}{\cos^2 x}\left(\dfrac{1-\cos x}{\cos x}\right)}$

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

$1 \cdot \dfrac{\cos^2 x}{\sin^2 x}$

$\cot^2 x = \cot^2 x$

linear velocity

how fast an object moves through an arc

$$LV = \frac{s}{t} = \frac{r\theta}{t} = r \cdot AS$$

angular speed: how fast an object moves through an angle

$$AS = \frac{\theta}{t}$$

Arc length: radius of a circle times the central angle in RADIANS

$s = r\theta$


1 revolution= 1 rotation= 360 degrees=2pi radians

radians is always the desired angular measure

any 10 problems off the solving worksheet for homework on 4/28/14