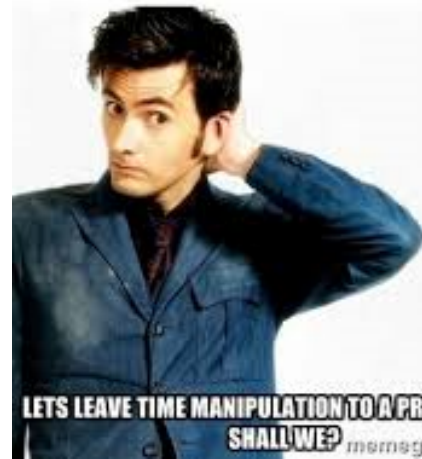


Thursday, March 8

SPRING FORWARD? FALL BACK? THATS
CUTE.



LETS LEAVE TIME MANIPULATION TO A PROFESSIONAL
SHALL WE? memegenerator.net


- ✧ OPENER - BELOW
- ✧ 5.4 EXAMPLES
- ✧ HOMEWORK QUESTIONS
- ✧ HOMEWORK IS WS

Quiz 5.3 - 5.4 Tomorrow!!
Identities are given!!!

TEST Moved to Wednesday!
Q3 Cumulative Moved to Monday (3/20)

OPENER: Find ① $\sin \frac{\pi}{8}$ ② $\tan \frac{5\pi}{8}$
③ Prove $\frac{2}{1+\cos 2x} = \sec^2 x$

$$\begin{aligned} \textcircled{1} \sin \frac{\pi}{8} &= \sin \frac{\frac{\pi}{4}}{2} = \sqrt{\frac{1-\cos \frac{\pi}{4}}{2}} = \sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}} \cdot \frac{2}{2} = \sqrt{\frac{2-\sqrt{2}}{4}} \\ &\downarrow \text{Quad 1} \\ &\text{POS} \\ &= \frac{\sqrt{2-\sqrt{2}}}{2} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \tan \frac{5\pi}{8} &= \tan \frac{\frac{10\pi}{8} + \frac{5\pi}{4}}{2} = \frac{\sin \frac{5\pi}{4}}{1 + \cos \frac{5\pi}{4}} \\ &= \frac{-\frac{\sqrt{2}}{2}}{1 + \frac{-\sqrt{2}}{2}} \cdot \frac{2}{2} = \frac{-\sqrt{2}}{2-\sqrt{2}} \end{aligned}$$


$$\textcircled{3} \frac{2}{1+\cos 2x} = \sec^2 x$$

$$\frac{2}{1+(2\cos^2 x - 1)} =$$

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

$$2\cos^2 x$$

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

$$\sec^2 x = \sec^2 x \checkmark$$

5.4 Solving Trig Equations w/ the Identities

① $\sin 2x = \cos x$ $[0, 2\pi)$

$$2\sin x \cos x = \cos x$$

$$2\sin x \cos x - \cos x = 0$$

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

$$\cos x = 0 \quad \sin x = \frac{1}{2}$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6}$$

② $\cos 2x + \cos x = 0$

Dbl. Id

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

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

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

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

$$x = \frac{\pi}{3}, \frac{5\pi}{3}, \pi$$

③ $\sin^2 x = 2\sin^2\left(\frac{x}{2}\right)$ $\xrightarrow{\text{Half-Angle Identity}} 2\left(\sin\left(\frac{x}{2}\right)\right)^2$

$$\sin^2 x = 2\left(\pm\sqrt{\frac{1-\cos x}{2}}\right)^2$$

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

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

$$\begin{aligned} 1 - \cos^2 x &= 1 - \cos x \\ \cancel{\cos^2 x} &= \cancel{\cos x} \\ \cos^2 x - \cos x &= 0 \\ \cos x (\cos x - 1) &= 0 \end{aligned}$$