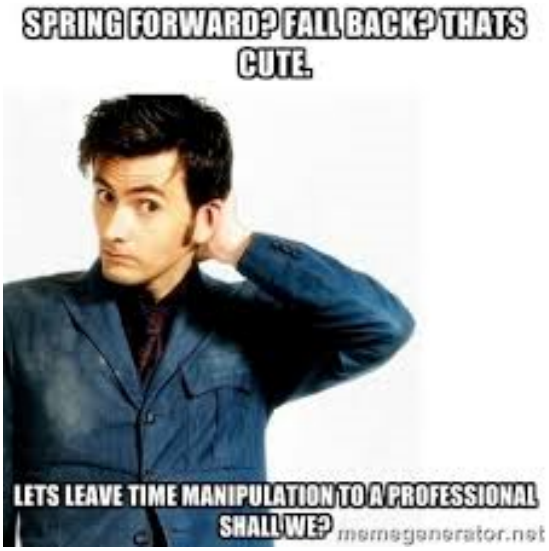
Thursday, March 8

- ✧ 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 $\frac{2}{1+\cos 2x} = \sec^2 x$

① $\sin\frac{\pi}{8} = \sin\frac{\frac{\pi}{4}}{2} = \pm\sqrt{\frac{1-\cos\frac{\pi}{4}}{2}} = \sqrt{\frac{1-\frac{\sqrt{2}}{2}}{2}\cdot\frac{2}{2}} = \sqrt{\frac{2-\sqrt{2}}{4}}$

↳ Quad 1 POS

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

② $\tan\frac{5\pi}{8} = \tan\frac{\frac{10\pi}{8}}{2} = \frac{\frac{5\pi}{4}}{2} = \frac{\sin\frac{5\pi}{4}}{1+\cos\frac{5\pi}{4}}$

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$= \frac{-\frac{\sqrt{2}}{2}}{1+\frac{-\sqrt{2}}{2}}\cdot\frac{2}{2} = \frac{-\sqrt{2}}{2-\sqrt{2}}$

③ $\frac{2}{1+\cos 2x} = \sec^2 x$

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

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

$2\cos^2 x$

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

$\sec^2 x = \sec^2 x$ ✓

5.4 Solving Trig Equations w/ the Identities

① $\sin 2x = \cos x \qquad [0, 2\pi)$

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

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

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

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

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

② $\cos 2x + \cos x = 0$

Dbl. Id

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

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

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

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

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

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

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

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

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

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

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

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

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

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