

Happy Friday, March 17th



Do Now: Find the value of each

$$(4+5)(-1+1) = 0$$

$$(\cancel{4-x})(3x+2x-4x-x) = 0$$

$$(5-1)(6+3) = 4$$

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$$* (\sin x - 1)(\sin x + 2) = 4$$

Before factoring

$$\sin^2 x + \sin x - 2 = 4$$

$$\sin^2 x + \sin x - 6 = 0$$

$$(\sin x - 1)(\sin x + 6)$$

$$0 \cdot 2$$

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What's coming:

* Take Home Quiz on Unit 8 LT3 this weekend

* Unit 8 Test next Friday

Questions?

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$$\sin(2x) = 2 \sin x \cos x$$

$$\sin \frac{x}{2} = \pm \sqrt{\frac{1 - \cos x}{2}}$$

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

$$\cos \frac{x}{2} = \pm \sqrt{\frac{1 + \cos x}{2}}$$

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

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

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

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Sum/Difference/Double/Half Angles

- Find Exact Values
- Condense Expressions
- Prove
- Solve

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Finding Exact Values

$$\cos(75)$$

$$\cos(30+45) = \cos 30 \cos 45 - \sin 30 \sin 45$$

$\begin{matrix} \uparrow & \uparrow \\ u & v \end{matrix}$
 $\frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} - \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$

$$\boxed{\frac{\sqrt{6} - \sqrt{2}}{4}} = .2588$$

$$\cos\left(\frac{x}{2}\right)$$

$$\cos\left(\frac{150}{2}\right) = \pm \sqrt{\frac{1 + \cos(150)}{2}}$$

$x=150$

$$\boxed{-\sqrt{\frac{1 - \frac{\sqrt{3}}{2}}{2}}} = .2588$$

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Finding Exact Values

$$\sin(105)$$

G 1-3
Sum/Diff

$$\sin(45 + 60) =$$

$$\sin 45 \cos 60 + (\cos 45 \sin 60)$$

$$\frac{\sqrt{2}}{2} \cdot \frac{1}{2} + \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2}$$

$$\frac{\sqrt{2} + \sqrt{6}}{4}$$

G 6-8
Double/Half

$$\sin\left(\frac{210}{2}\right) \quad x=210$$

$$= \pm \sqrt{\frac{1 + \cos(210)}{2}}$$

$$= \pm \sqrt{\frac{1 - \sqrt{3}/2}{2}}$$

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Condense

$$x=33$$

$$\frac{2 \tan(33)}{1 - \tan^2(33)} = \tan(2x) = \boxed{\tan(66)}$$

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Condense

$$\sqrt{\frac{1 - \cos 22}{2}} = \sin(11)$$

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Solve

$$\sin(2x) = 2 \sin x$$

$$\begin{aligned} \sin(2x) - 2 \sin x &= 0 \\ 2 \sin x \cos x - 2 \sin x &= 0 \\ 2 \sin x (\cos x - 1) &= 0 \\ \frac{2 \sin x \cos x}{2 \sin x} & \\ \frac{2 \sin x}{2 \sin x} & \\ 2 \sin x = 0 & \quad \cos x - 1 = 0 \\ \sin x = 0 & \quad \cos x = 1 \\ \boxed{x = 0, \pi} & \end{aligned}$$

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Solve

$$\underline{\cos(2x)} = \sin x$$

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

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

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

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

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

$$\sin x = -1$$

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

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Exit Slip:

Rewrite $\sin(465)$ in two ways.

Have a great weekend. Quiz due Monday. Relax,
one more week :)

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