

Questions over HW?**WARM UP**

Simplify the following expression using a formula from last night's homework.

$$\sin(u + u) =$$

p. 387

Nov 7-3:30 PM

Nov 8-2:59 PM

Example p. 394, #4

Solve; state the answers from 0 to 2π .

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

p. 394, #3 (HW)

Find $\tan(2u)$ using a double-angle formula. The following is given:

$$\csc u = 3 \quad \frac{\pi}{2} < u < \pi$$

p. 394, #15 (HW)

Nov 8-3:13 PM

Nov 8-3:16 PM

POWER-REDUCING FORMULAS

$$\sin^2 u = \frac{1 - \cos(2u)}{2}$$

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

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



Rewrite the expression in terms of the first power of cosine.

$$\sin^4 x$$

p. 394, #23 (HW)

Nov 8-3:26 PM

Nov 8-3:38 PM

HOMEWORK

...be memorizing these formulas

5.5a (p. 394): 1-29 (odd), omit 9 & 27

5.4-5.5 Quiz on Tuesday (Take home)

It will need to be back to me by 8:15 am on Monday Oct. 20

No excuses :)

PROOF THAT GIRLS ARE EVIL

First we state that girls require time and money:

$$\text{Girls} = \text{Time} \times \text{Money}$$

And as we all know "Time is Money"

$$\text{Time} = \text{Money}$$

Therefore:

$$\text{Girls} = \text{Money} \times \text{Money} = (\text{Money})^2$$

And because "Money is The Root of All Evil"

$$\text{Money} = \sqrt{\text{Evil}}$$

Therefore:

$$\text{Girls} = (\sqrt{\text{Evil}})^2$$

And we are forced to conclude that:

$$\text{Girls} = \text{Evil}$$

Nov 8-3:45 PM

Nov 8-3:43 PM

Power-Reducing Formulas for Sine and Cosine:

$$\sin^2 u = \frac{1 - \cos(2u)}{2} \quad \cos^2 u = \frac{1 + \cos(2u)}{2}$$

Substitute $u = x/2$

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

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

Nov 11-4:36 PM

Example
Use a half-angle formula to determine the exact value of $\sin(22.5^\circ)$.

$$\sin\left(\frac{45^\circ}{2}\right) = \pm \sqrt{\frac{1 - \cos(45^\circ)}{2}}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2}$$

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

p. 395, #41 (HW)

Nov 11-5:00 PM

Example
Find the exact value of $\sin(u/2)$ if $\sin(u) = 5/13$ and $\frac{\pi}{2} < u < \pi$

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

$$= \pm \sqrt{\frac{1 - \left(-\frac{12}{13}\right)}{2}}$$

$$= \pm \sqrt{\frac{\frac{13}{13} + \frac{12}{13}}{2}}$$

$$= \pm \sqrt{\frac{\frac{25}{13}}{2}}$$

$$= \pm \frac{\sqrt{25}}{\sqrt{26}}$$

$\cos u = -\frac{12}{13}$

p. 395, #49 (HW)

Nov 11-5:00 PM

HOMework
...aaaaand that's a wrap!

5.5b (p. 394): 33-53 (every other odd)

5.4-5.5 Quiz on Thursday

Nov 11-5:32 PM

Solve in the interval $[0, 2\pi)$

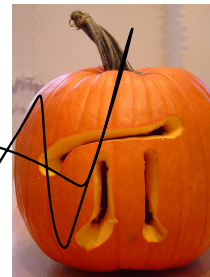
$$\sin\left(\frac{x}{2}\right) + \cos x - 1 = 0$$

p. 395, #57 (HW)

Nov 11-5:31 PM

Countdown to Thanksgiving Break!

This week	Next week
M: 5.5b	M: 6.2a
T: Quiz Review	T: 6.2b
W: Quiz (5.4-5.5)	W: No School!
R: 6.1	R: Thanksgiving!
F: 6.1	F: Black Friday!



Nov 11-4:30 PM

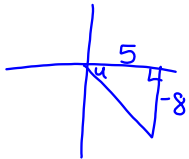
$$\begin{aligned} \textcircled{33} \quad \sin^2 2x \cos^2 2x &= \left(\frac{1 - \cos(4x)}{2}\right) \left(\frac{1 + \cos(4x)}{2}\right) \\ &= \frac{1}{4} (1 - \cos^2(4x)) \\ &= \frac{1}{4} \left(\frac{2}{2} - \frac{1 + \cos(8x)}{2}\right) \quad \cos^2 u = \frac{1 + \cos(2u)}{2} \\ &= \frac{1}{4} \left(\frac{2 - 1 - \cos(8x)}{2}\right) \\ &= \frac{1}{8} (1 - \cos(8x)) \end{aligned}$$

Oct 13-10:48 AM

$$\begin{aligned} \textcircled{45} \quad \sin \frac{3\pi}{8} \\ \sin\left(\frac{1}{2} \cdot \frac{3\pi}{4}\right) &= \sqrt{\frac{1 - \cos \frac{3\pi}{4}}{2}} \end{aligned}$$

Oct 13-10:54 AM

(49) $\tan u = -\frac{8}{5}$ IV

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


Oct 13-11:06 AM

(5) $4\sin x \cos x = 1$ $[0, 2\pi)$

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

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

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

$$2x = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{13\pi}{6}, \frac{17\pi}{6}$$

$$x = \frac{\pi}{12}, \frac{5\pi}{12}, \frac{13\pi}{12}, \frac{17\pi}{12}$$

Oct 13-11:07 AM

(29) $\sin^2 2x = \frac{1 - \cos(4x)}{2}$

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

Oct 13-11:11 AM