Happy Monday, March 13th

Do Now:

Turn in Quiz

Using only the radian measures on unit circle, find angles that add to $\frac{11\pi}{12}$
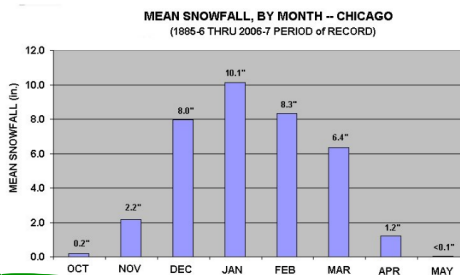
MEAN SNOWFALL, BY MONTH -- CHICAGO
(1885-6 THRU 2006-7 PERIOD of RECORD)

$\frac{3\pi}{4} + \frac{\pi}{6}$

$\frac{9\pi}{12} + \frac{2\pi}{12}$

$\frac{\pi}{2} + \frac{5\pi}{12}$

$90°$

$\frac{2\pi}{3} + \frac{\pi}{4}$

$\frac{7\pi}{6} - \frac{\pi}{4}$

$\frac{5\pi}{4} - \frac{\pi}{3}$

Mar 13-7:01 AM

- U6LT3 Inverse Trig

- U6LT4 Law of Sine/Cosine

- U7LT3 Modeling

- U8LT1 Proofs

- U8LT2 Solving

- U9LT3 and U9LT4

Optional next Thursday, March 16th

Mar 9-6:57 AM

Sign up for Optionals Tomorrow!!

Pi DAY is TOMORROW!!!!!! Please bring something to share (or paper towels/cups)

Mar 13-7:45 AM

U8LT3 I can prove and solve multi-angle and half angle identities

Materials: Notesheet, Calculator

Mar 13-7:49 AM

Does $\sin(45° + 30°) = \sin 75°$?

TRUE

$$\sqrt{45 + 30} = \sqrt{75}$$

Does $\sin(45°) + \sin(30°) = \sin 75°$

False

$$\sqrt{45} + \sqrt{30} \neq \sqrt{45 + 30}$$

Mar 13-7:51 AM

u & v
Angle
measures

Sum and Difference Formulas

Don't switch angles

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

$\sin(u - v) = \sin u \cos v - \cos u \sin v$

Sin v cos u
Sin u cos v

$\cos(u + v) = \cos u \cos v - \sin u \sin v$

$\cos(u - v) = \cos u \cos v + \sin u \sin v$

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

$$\tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

Mar 13-7:53 AM

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1. $\sin 22° \cos 13° + \cos 22° \sin 13°$

$\sin(22+13) \Rightarrow \boxed{\sin(35)}$

$\sin(u+v)$

2. $\cos 94° \cos 18° + \sin 94° \sin 18°$

$\cos(u-v) \quad \boxed{\cos(76)}$

$\cos(94-18)$

3. $\sin \dfrac{\pi}{3} \cos \dfrac{\pi}{7} - \sin \dfrac{\pi}{7} \cos \dfrac{\pi}{3}$

$\dfrac{3\pi}{21} - \dfrac{3\pi}{21} = \dfrac{4\pi}{21}$

$\sin\left(\dfrac{4\pi}{21}\right)$

$\dfrac{\pi}{3} - \dfrac{\pi}{7}$

4. $\dfrac{\tan \dfrac{\pi}{2} - \tan \dfrac{\pi}{3}}{1 + \tan \dfrac{\pi}{2} \tan \dfrac{\pi}{3}}$

$\tan\left(\dfrac{\pi}{2} - \dfrac{\pi}{3}\right)$

$\tan\left(\dfrac{\pi}{6}\right)$

Mar 13-7:57 AM

What special angles can you use to make:

$15°$ $\quad \pi/3 - \pi/4$

$60° - 45°$

$75°$ $\quad \pi/4 + \pi/6$

$\dfrac{11\pi}{12} \quad \dfrac{2\pi}{3} + \dfrac{\pi}{4}$

$\dfrac{\pi}{12} \quad \dfrac{\pi}{3} - \dfrac{\pi}{4}$

Mar 13-7:59 AM

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No Calculator!!

5. $\cos 75°$ .258819

$\cos(75) = \cos(45+30)$

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

$\dfrac{\sqrt{2}}{2} \cdot \dfrac{\sqrt{3}}{2} - \dfrac{\sqrt{2}}{2} \cdot \dfrac{1}{2}$

$\dfrac{\sqrt{6}}{4} - \dfrac{\sqrt{2}}{4} \Rightarrow \boxed{\dfrac{(\sqrt{6} - \sqrt{2})}{4}}$ .258819

6. $\sin\dfrac{7\pi}{12} = \sin\left(\dfrac{\pi}{3} + \dfrac{\pi}{4}\right)$

$\sin\left(\dfrac{\pi}{3}\right)\cos\left(\dfrac{\pi}{4}\right) + \cos\left(\dfrac{\pi}{3}\right)\sin\left(\dfrac{\pi}{4}\right)$

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

$\boxed{\dfrac{\sqrt{6} + \sqrt{2}}{4}}$

.258819

Mar 13-8:00 AM

Prove the identity.

7. $\cos\left(x - \dfrac{\pi}{4}\right) = \dfrac{\sqrt{2}}{2}(\cos x + \sin x)$

LHS

$*\ \cos(x)\cos\left(\dfrac{\pi}{4}\right) + \sin(x)\sin\left(\dfrac{\pi}{4}\right)$

$\underset{\dfrac{\sqrt{2}}{2}}{} \underset{\dfrac{\sqrt{2}}{2}}{}$

$\dfrac{\sqrt{2}}{2}\left(\cos(x) + \sin(x)\right)$ $\square$

QED

Mar 13-8:01 AM

Homework is on the back side of notes.

Exit Slip: Without a calculator, find the value of

$$\frac{13\pi}{12}$$

8. $\tan \dfrac{13\pi}{12}$

Mar 13-8:01 AM