Today's Plan:

Learning Target (standard): I will use the sum and difference trigonometric identities to evaluate expressions. I will establish identities using the sum and difference identities.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.470 #4-28(by 4)

$4) -2-\sqrt{3}$

$8) 2-\sqrt{3}$

$12) -2+\sqrt{3}$

$16) \frac{\sqrt{3}}{2}$

$20) -1$

$24a) \frac{2\sqrt{5}}{25}$

$b) \frac{11\sqrt{5}}{25}$

$c) \frac{2\sqrt{5}}{5}$

$d) -2$

$28a) \frac{-2\sqrt{6}+1}{6}$

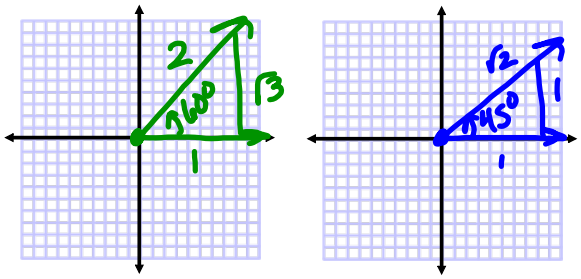
$b) \frac{2\sqrt{2}+\sqrt{3}}{6}$

$c) \frac{-2\sqrt{6}-1}{6}$

$d) \frac{-9\sqrt{3}-8\sqrt{2}}{5}$

Find the exact value.

$$\cos\frac{7\pi}{12}$$



$= \cos 105^\circ$

$= \cos(\underset{\alpha}{60^\circ} + \underset{\beta}{45^\circ})$

$= \cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$

$= \left(\frac{1}{2}\right)\left(\frac{\sqrt{2}}{2}\right) - \left(\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2}\right)$

$= \frac{\sqrt{2}}{4} - \frac{\sqrt{6}}{4}$

$= \frac{\sqrt{2}-\sqrt{6}}{4}$

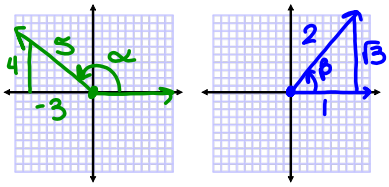
Find the exact value.

$\tan\alpha = -\frac{4}{3}, \frac{\pi}{2} < \alpha < \pi$

$\cos\beta = \frac{1}{2}, 0 < \beta < \frac{\pi}{2}$

$\sin(\alpha+\beta) =$

$\cos(\alpha+\beta) =$



a) $\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$

$= \left(\frac{4}{5}\right)\left(\frac{1}{2}\right) + \left(\frac{-3}{5}\right)\left(\frac{\sqrt{3}}{2}\right)$

$= \frac{4}{10} - \frac{3\sqrt{3}}{10}$

$= \frac{4-3\sqrt{3}}{10}$

b) $\cos(\alpha+\beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$= \left(\frac{-3}{5}\right)\left(\frac{1}{2}\right) - \left(\frac{4}{5}\right)\left(\frac{\sqrt{3}}{2}\right)$

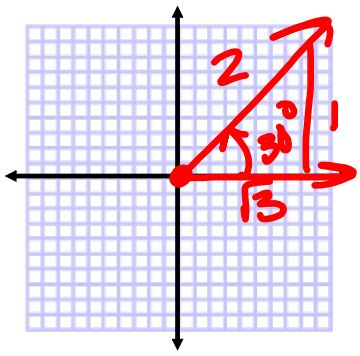
$= -\frac{3}{10} - \frac{4\sqrt{3}}{10}$

$= \frac{-3-4\sqrt{3}}{10}$

Find the exact value.

$$\sin 20^\circ \cos 10^\circ + \cos 20^\circ \sin 10^\circ$$

α β



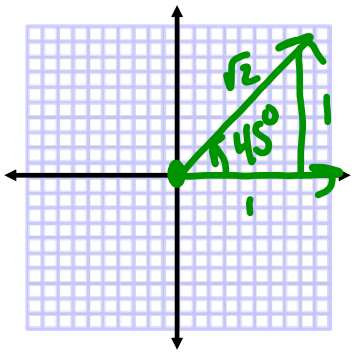
$\sin(\alpha+\beta) = \sin(20^\circ+10^\circ)$

$= \sin 30^\circ$

$= \frac{1}{2}$

Find the exact value.

$$\frac{\tan 20^\circ + \tan 25^\circ}{1 - \tan 20^\circ \tan 25^\circ}$$



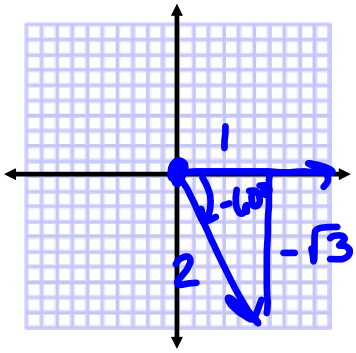
$= \tan(20^\circ+25^\circ)$

$= \tan 45^\circ$

$= 1$

Find the exact value.

$$\cos\frac{\pi}{12}\cos\frac{5\pi}{12}+\sin\frac{5\pi}{12}\sin\frac{\pi}{12}$$



$= \cos\left(\frac{\pi}{12}-\frac{5\pi}{12}\right)$

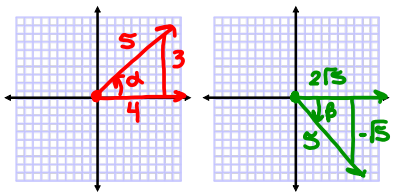
$= \cos\left(-\frac{\pi}{3}\right)$

$= \frac{1}{2}$

Find the exact value.

$\sin\alpha=\frac{3}{5}, 0<\alpha<\frac{\pi}{2}$

$\cos\beta=\frac{2\sqrt{5}}{5}, -\frac{\pi}{2}<\beta<0$



$\tan(\alpha+\beta)=\frac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$

$=\frac{\left(\frac{3}{4}\right)+\left(-\frac{1}{2}\right)}{1-\left(\frac{3}{4}\right)\left(-\frac{1}{2}\right)}$

$=\frac{\frac{3}{4}-\frac{2}{4}}{1+\frac{3}{8}}$

$=\frac{\frac{1}{4}}{\frac{11}{8}}$ $=\frac{1}{\cancel{4}}\cdot\frac{\cancel{8}2}{11}$

$=\frac{2}{11}$

$\cot(\alpha+\beta)$

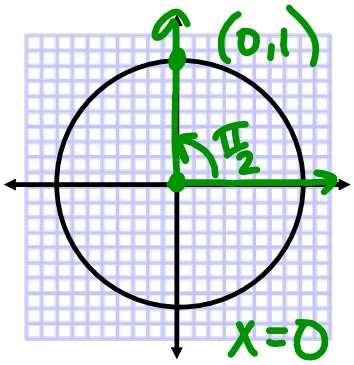
$=\frac{1}{\tan(\alpha+\beta)}$

$=\frac{11}{2}$

Establishing Identities using Angle Identities:

$$\sin\left(\frac{\pi}{2}+\theta\right)=\cos\theta$$

(α = $\frac{\pi}{2}$, β = θ)



$x=0$

$y=1$

$r=1$

$$\left(\sin\tfrac{\pi}{2}\cos\theta+\cos\tfrac{\pi}{2}\sin\theta\right)$$

$$(1)\cos\theta+(0)\sin\theta$$

$$\cos\theta+0$$

$$\cos\theta \quad \therefore \text{Q.E.D.}$$

Establish the identity.

$$\sin(\alpha+\beta)+\sin(\alpha-\beta)=2\sin\alpha\cos\beta$$

$$\left(\sin\alpha\cos\beta+\cos\alpha\sin\beta\right)+\left(\sin\alpha\cos\beta-\cos\alpha\sin\beta\right)$$

$$\sin\alpha\cos\beta+\sin\alpha\cos\beta$$

$$2\sin\alpha\cos\beta \quad \therefore \text{Q.E.D.}$$

Establish the identity.

$$\frac{\cos(\alpha+\beta)}{\cos\alpha\cos\beta} = 1 - \tan\alpha\tan\beta$$

$$\frac{(\cos\alpha\cos\beta - \sin\alpha\sin\beta)}{\cos\alpha\cos\beta}$$

$$\frac{\cos\alpha\cos\beta}{\cos\alpha\cos\beta} - \frac{\sin\alpha\sin\beta}{\cos\alpha\cos\beta}$$

$$1 - \frac{\sin\alpha}{\cos\alpha}\cdot\frac{\sin\beta}{\cos\beta}$$

$$1 - (\tan\alpha)(\tan\beta)$$

$$1 - \tan\alpha\tan\beta \quad \therefore \text{Q.E.D.}$$

Establish the identity.

$$\frac{\sin(\alpha-\beta)}{\sin\alpha\cos\beta} = 1 - \cot\alpha\tan\beta$$

$$\frac{(\sin\alpha\cos\beta - \cos\alpha\sin\beta)}{\sin\alpha\cos\beta}$$

$$\frac{\sin\alpha\cos\beta}{\sin\alpha\cos\beta} - \frac{\cos\alpha\sin\beta}{\sin\alpha\cos\beta}$$

$$1 - \frac{\cos\alpha}{\sin\alpha}\cdot\frac{\sin\beta}{\cos\beta}$$

$$1 - (\cot\alpha)(\tan\beta)$$

$$1 - \cot\alpha\tan\beta \quad \therefore \text{Q.E.D.}$$

Assignment:

p.471 #32-52 even