Today's Plan:

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

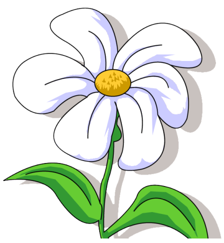
Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

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.

Take a few minutes to go over any of the "proofs" from yesterday!

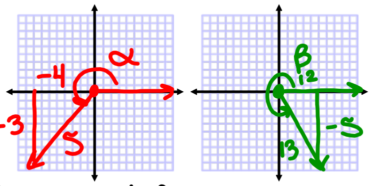
"Proofs" Test will be on Tuesday!



Use the given information to find the exact value of the expressions.

$\sin\alpha = -\frac{3}{5}, \pi < \alpha < \frac{3\pi}{2}$ $\sin(\alpha+\beta) =$

$\cos\beta = \frac{12}{13}, \frac{3\pi}{2} < \beta < 2\pi$ $\cos(\alpha+\beta) =$



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

$= \left(-\frac{3}{5}\right)\left(\frac{12}{13}\right) + \left(-\frac{4}{5}\right)\left(-\frac{5}{13}\right)$

$= -\frac{36}{65} + \frac{20}{65}$

$= -\frac{16}{65}$

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

$= \left(-\frac{4}{5}\right)\left(\frac{12}{13}\right) - \left(-\frac{3}{5}\right)\left(-\frac{5}{13}\right)$

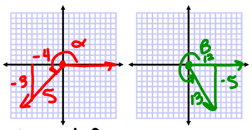
$= -\frac{48}{65} - \frac{15}{65}$

$= -\frac{63}{65}$

Use the given information to find the exact value of the expressions.

$\sin\alpha = -\frac{3}{5}, \pi < \alpha < \frac{3\pi}{2}$ $\sin(\alpha-\beta) =$

$\cos\beta = \frac{12}{13}, \frac{3\pi}{2} < \beta < 2\pi$ $\tan(\alpha+\beta) =$



c) $\sin(\alpha-\beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$

$= \left(-\frac{3}{5}\right)\left(\frac{12}{13}\right) - \left(-\frac{4}{5}\right)\left(-\frac{5}{13}\right)$

$= -\frac{36}{65} - \frac{20}{65}$

$= -\frac{56}{65}$

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

$= \frac{\frac{3}{4} - \frac{5}{12}}{1 - \left(\frac{3}{4}\right)\left(-\frac{5}{12}\right)} = \frac{\frac{9}{12} - \frac{5}{12}}{\frac{48}{48} + \frac{15}{48}} = \frac{\frac{4}{12}}{\frac{63}{48}} = \frac{\frac{1}{3}}{\frac{63}{48}}$

$= \frac{1}{\cancel{3}_{1}} \cdot \frac{\cancel{48}^{16}}{63}$

$= \frac{16}{63}$

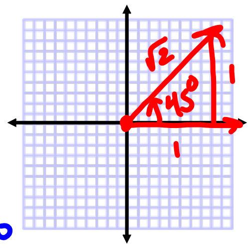
$\tan(\alpha+\beta) = \frac{\sin(\alpha+\beta)}{\cos(\alpha+\beta)}$

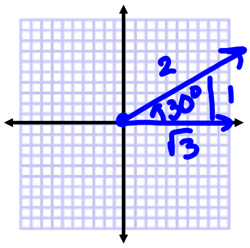
$= \frac{-\frac{16}{65}}{-\frac{63}{65}} = -\frac{16}{65} \cdot \frac{65}{63}$

$= \frac{16}{63}$

Find the exact value.

$$\tan\left(75^\circ\right)$$





$$= \tan(45^\circ + 30^\circ)$$

$$= \frac{\tan 45^\circ + \tan 30^\circ}{1 - \tan 45^\circ \tan 30^\circ}$$

$$= \frac{(1) + \frac{\sqrt{3}}{3}}{1 - (1)\left(\frac{\sqrt{3}}{3}\right)} = \frac{\frac{3+\sqrt{3}}{3}}{\frac{3-\sqrt{3}}{3}} = \frac{3+\sqrt{3}}{\cancel{3}} \cdot \frac{\cancel{3}}{3-\sqrt{3}}$$

$$= \frac{3+\sqrt{3}}{3-\sqrt{3}} \cdot \frac{3+\sqrt{3}}{3+\sqrt{3}} = \frac{9+6\sqrt{3}+3}{9-3} = \frac{12+6\sqrt{3}}{6}$$

$$= 2+\sqrt{3}$$

Establish the Identity.

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

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

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

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

$$\frac{\sin\alpha\cos\beta + \cos\alpha\sin\beta}{\cancel{\cos\alpha\cos\beta}} \cdot \frac{\cancel{\cos\alpha\cos\beta}}{\sin\alpha\cos\beta - \cos\alpha\sin\beta}$$

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

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

$$\frac{\sin(\alpha+\beta)}{\sin(\alpha-\beta)} \quad \therefore \text{Q.E.D.}$$

Establish the Identity.

$$\cos^2\theta\left(1+\tan^2\theta\right)=1$$

$$\cos^2\theta\left(\left(\sec^2\theta\right)\right)$$

$$\cos^2\theta\left(\left(\frac{1}{\cos^2\theta}\right)\right)$$

$$1 \quad \therefore \text{Q.E.D.}$$

Establish the Identity.

$$4\cos^2\theta+3\sin^2\theta=3+\cos^2\theta$$

$$\cos^2\theta+3\cos^2\theta+3\sin^2\theta$$

$$\cos^2\theta+3\left(\cos^2\theta+\sin^2\theta\right)$$

$$\cos^2\theta+3((1))$$

$$3+\cos^2\theta$$

$$\therefore \text{Q.E.D.}$$

Establish the Identity.

$$\csc\theta - \sin\theta = \cos\theta\cot\theta$$

$$\left(\frac{1}{\sin\theta}\right) - \sin\theta$$

$$\frac{1}{\sin\theta} - \frac{\sin^2\theta}{\sin\theta}$$

$$\frac{1-\sin^2\theta}{\sin\theta}$$

$$\frac{(\sin^2\theta+\cos^2\theta)-\sin^2\theta}{\sin\theta}$$

$$\frac{\cos^2\theta}{\sin\theta}$$

$$\cos\theta \cdot \frac{\cos\theta}{\sin\theta}$$

$$\cos\theta(\cot\theta)$$

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

Assignment:

p.516 Practice Problems

#33,35,37, 41-49 odd (a-d)