Name Mine Date _____

Practice 8.4: Sum & Difference Formulas

Use the Sum and Difference Formulas to find the exact values of the following trig functions. Show your work.

1. $\cos 75°$ *use* $30° + 45° = 75°$

2. $\sin 15°$ $= \sin(45° - 30°) = \sin 45°\cos 30° - \cos 45°\sin 30°$ *use* $45° - 30° = 15°$

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

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

3. $\tan 105°$ *use* $60° + 45° = 105°$

4. $\cos 195°$ *use* $225° - 30° = 195°$

5. $\sin \frac{7\pi}{12}$ *use* $\frac{\pi}{3} + \frac{\pi}{4} = \frac{7\pi}{12}$

6. $\tan 255° = \frac{\tan(300°) - \tan 45°}{1 + \tan 300° \cdot \tan 45°} = \frac{-\sqrt{3} - 1}{1 + (-\sqrt{3})(1)} = \frac{-1-\sqrt{3}}{1-\sqrt{3}}$ *use* $300° - 45° = 255°$

$\tan(300° 45°)$ can be simplified more

7. Use the Sum and Difference Formulas to write the trig function of an angle.

a. $\cos 25° \cos 15° - \sin 25° \sin 15° =$

b. $\sin 140° \cos 50° - \cos 140° \sin 50° ° =$ $\sin(140° - 50°) = \sin 90° = 1$

c. $\dfrac{\tan 325° - \tan 86°}{1 + \tan 325° \tan 86°} =$

d. $\cos\frac{\pi}{7}\cos\frac{\pi}{5} - \sin\frac{\pi}{7}\sin\frac{\pi}{5} =$ $\cos\left(\frac{\pi}{7} + \frac{\pi}{5}\right) = \cos\left(\frac{5\pi}{35} + \frac{7\pi}{35}\right) = \cos\frac{12\pi}{35}$

$\frac{5\pi}{35}$ $\frac{7\pi}{35}$