

Practice Quiz

1. Find the exact measure for
- $\tan 15^\circ = \tan(45^\circ - 30^\circ)$

$$\frac{\tan 45^\circ - \tan 30^\circ}{1 + \tan 45^\circ \tan 30^\circ} = \frac{1 - \frac{\sqrt{3}}{3}}{1 + (1)\left(\frac{\sqrt{3}}{3}\right)} = \frac{\frac{3}{3} - \frac{\sqrt{3}}{3}}{\frac{3}{3} + \frac{\sqrt{3}}{3}} = \frac{\frac{3-\sqrt{3}}{3}}{\frac{3+\sqrt{3}}{3}} = \frac{3-\sqrt{3}}{3} \cdot \frac{3}{3+\sqrt{3}}$$

Folk

$$FL = \frac{(3-\sqrt{3})(3-\sqrt{3})}{(3+\sqrt{3})(3-\sqrt{3})} = \frac{9-3\sqrt{3}-3\sqrt{3}+3}{9-3} = \frac{12-6\sqrt{3}}{6} = \boxed{2-\sqrt{3}}$$

2. Find the exact measure for
- $\sin \frac{7\pi}{12} = \sin\left(\frac{4\pi}{12} + \frac{3\pi}{12}\right) = \sin\left(\frac{\pi}{3} + \frac{\pi}{4}\right)$

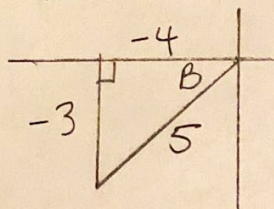
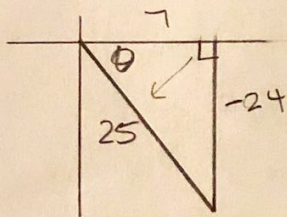
$$= \sin \frac{\pi}{3} \cos \frac{\pi}{4} + \cos \frac{\pi}{3} \sin \frac{\pi}{4}$$

$$= \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} + \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$$

$$= \frac{\sqrt{6}}{4} + \frac{\sqrt{2}}{4} = \boxed{\frac{\sqrt{6} + \sqrt{2}}{4}} \text{ or } \boxed{\frac{\sqrt{2} + \sqrt{6}}{4}}$$

3. Draw and label the given triangles using the following information:

- a.
- θ
- is in quadrant IV and
- $\sec \theta = \frac{25}{7a}$
- ,
- $\cos = \frac{7}{25}$
- b.
- B
- is in quadrant III and
- $\cot B = \frac{4}{3}$



$$\tan = \frac{3}{4} \text{ a}$$

4. Use the triangles above to find the following:
-
- (Show expansion, substitution, math and answer!)

a. $\sin(B + \theta)$

$$\sin B \cos \theta + \cos B \sin \theta$$

$$\frac{-3}{5} \cdot \frac{7}{25} + \frac{-4}{5} \cdot \frac{-24}{25}$$

$$\frac{-21}{125} + \frac{96}{125} = \frac{75}{125} = \boxed{\frac{3}{5}}$$

b. $\cos\left(\frac{2\pi}{3} - B\right)$

$$\cos \frac{2\pi}{3} \cos B + \sin \frac{2\pi}{3} \sin B$$

$$-\frac{1}{2} \cdot \frac{-4}{5} + \frac{\sqrt{3}}{2} \cdot \frac{-3}{5}$$

$$\frac{4}{10} - \frac{3\sqrt{3}}{10} = \boxed{\frac{4-3\sqrt{3}}{10}} \text{ or } \boxed{\frac{-3\sqrt{3}+4}{10}}$$

5. Write the following as a single trig function of a single angle: (Hint ... think of the identities backwards.)

$$\cos 25^\circ \cos 32^\circ - \sin 25^\circ \sin 32^\circ$$

$$\cos(25^\circ + 32^\circ) = \boxed{\cos 57^\circ}$$