More Unit Circle Practice

Precalculus Fall 2013 **Unit Circle (±,÷,×) Practice** Name: Key

1. $\sin 210° + \tan\frac{\pi}{4} - \cos(-180°)$

$\frac{-1}{2} + 1 - -1 = \frac{-1}{2} + 1 + 1 = \boxed{\frac{3}{2}}$

2. $\left(\sin\left(\frac{5\pi}{4}\right)\right)(\sec(45°) - \tan(-\pi)) + \csc 690°$

$\cos 45° = \frac{\sqrt{2}}{2} \rightarrow \sec 45° = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

$\sin 690° = \sin 330° = -\frac{1}{2} \rightarrow \csc 330° = -2$

$\left(-\frac{\sqrt{2}}{2}\right)(\sqrt{2} - 0) + -2 = -\frac{\sqrt{2}}{2} \cdot \sqrt{2} - 2 = -\frac{2}{2} - 2 = -1 - 2 = \boxed{-3}$

3. $\csc\frac{2\pi}{3} \div \cos\frac{2\pi}{3} = \frac{2\sqrt{3}}{3} \div \frac{-1}{2}$

$\sin\frac{2\pi}{3} = \sqrt{3}/2$

$\csc\frac{2\pi}{3} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

$\frac{2\sqrt{3}}{3} \cdot \frac{-2}{1} = \boxed{\frac{-4\sqrt{3}}{3}}$

4. $\cos\left(-\frac{13\pi}{6}\right) + \left(\cos\frac{17\pi}{4}\right)(\cos(-240°))$

$\cos\left(-\frac{\pi}{6}\right) \quad \cos\left(\frac{\pi}{4}\right)$

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

5. $\cot 135° + (\csc 405°)(\sin 120°) - \sin\frac{3\pi}{2} - \sin\frac{4\pi}{3} \cdot \cos 315°$

$\frac{-\sqrt{2}/2}{\sqrt{2}/2}$ $\quad \csc 45°$

$\sin 45° = \frac{\sqrt{2}}{2}$

$\csc 45° = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

$-1 + \sqrt{2} \cdot \frac{\sqrt{3}}{2} - -1 - -\frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} =$ $\quad -1 + \frac{\sqrt{6}}{2} + 1 + \frac{\sqrt{6}}{4}$

$\frac{\sqrt{6}}{2} + \frac{\sqrt{6}}{4}$

$\frac{2\sqrt{6}}{4} + \frac{\sqrt{6}}{4} = \boxed{\frac{3\sqrt{6}}{4}}$

6. $\tan(-150°) + \csc(210°)\cot(-210°)$

$\frac{-1/2}{-\sqrt{3}/2} = \frac{-1}{2} \cdot \frac{2}{-\sqrt{3}}$ $\quad \sin(210°) = \frac{-1}{2}$ $\quad -\sqrt{3}$

$= \frac{-1}{-\sqrt{3}} = \frac{\sqrt{3}}{3}$ $\quad \csc(210°) = -2$

$\frac{\sqrt{3}}{3} + -2 \cdot -\sqrt{3} = \frac{\sqrt{3}}{3} + 2\sqrt{3} = \frac{\sqrt{3}}{3} + \frac{6\sqrt{3}}{3} = \boxed{\frac{7\sqrt{3}}{3}}$

7. $\cot 315° \cdot \sec\frac{7\pi}{4} + \csc 330° \cdot \sin\frac{3\pi}{4} - \cos\frac{5\pi}{4} \cdot \sec 0$

$\cos\frac{7\pi}{4} = \frac{\sqrt{2}}{2}$ $\quad \sin 330° = -\frac{1}{2}$ $\quad \cos 0\pi = 1$ $\quad \sec 0\pi = 1$

$\sec\frac{7\pi}{4} = \frac{2}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$ $\quad \csc 330° = -2$

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

8. $\cos(-150°)(\sin 45°)(\cos 3\pi) - \left(\csc\frac{5\pi}{6}\right)\left(\sin\frac{13\pi}{4}\right)\left(\sin\left(-\frac{2\pi}{3}\right)\right)$

$\sin\frac{5\pi}{6} = \frac{1}{2}$ $\quad \sin\frac{5\pi}{4}$

$\csc\frac{5\pi}{6} = 2$

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

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

Answers: 1. $\frac{3}{2}$ 2. -3 3. $-\frac{4\sqrt{3}}{3}$ 4. $\frac{2\sqrt{3}-\sqrt{2}}{4}$ 5. $\frac{3\sqrt{6}}{4}$ 6. $\frac{7\sqrt{3}}{3}$ 7. $\frac{-3\sqrt{2}}{2}$ 8. $\frac{-\sqrt{6}}{4}$