

Practice #13 Alg 2 Unit Circle-Radians and Tangent Wednesday, April 1, 2020

Find the EXACT value of each using the Unit Circle. You can find a copy of the Unit Circle on my blog post for today.

1. $\tan 210^\circ$

2. $\tan 180^\circ$

3. $\tan 90^\circ$

4. $\cos \frac{5\pi}{6}$

5. $\tan 2\pi$

6. $\sin \frac{3\pi}{2}$

For the remaining problems first find an angle that is coterminal to the given angle and can be found on the Unit Circle then evaluate the given function using that coterminal angle.

7. $\tan 1440^\circ$

8. $\tan(-135^\circ)$

9. $\tan \frac{11\pi}{2}$

10. $\cos \frac{-17\pi}{6}$

11. $\sin \frac{14\pi}{3}$

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Find the EXACT value of each using the Unit Circle. You can find a copy of the Unit Circle on my blog post for today.

1. $\tan 210^\circ = \boxed{\frac{\sqrt{3}}{3}}$

$= \frac{y}{x} \text{ at } 210^\circ$

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

2. $\tan 180^\circ = \boxed{0}$

$= \frac{y}{x} \text{ at } 180^\circ$

$= \frac{0}{-1} = 0$

3. $\tan 90^\circ = \boxed{\text{undefined}}$

$= \frac{y}{x} \text{ at } 90^\circ$

$= \frac{1}{0} = \text{undefined}$

4. $\cos \frac{5\pi}{6} = \boxed{-\frac{\sqrt{3}}{2}}$

$= x \text{ at } \frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$

5. $\tan 2\pi = \boxed{0}$

$= \frac{y}{x} \text{ at } 2\pi = \frac{0}{1} = 0$

6. $\sin \frac{3\pi}{2} = \boxed{-1}$

$= y \text{ at } \frac{3\pi}{2} = -1$

For the remaining problems first find an angle that is coterminal to the given angle and can be found on the Unit Circle then evaluate the given function using that coterminal angle.

7. $\tan 1440^\circ = \boxed{0}$

$1440^\circ - 1080^\circ = 360^\circ$

$\tan 1440^\circ = \tan 360^\circ$

$= \frac{y}{x} \text{ at } 360^\circ$

$= \frac{0}{1} = 0$

8. $\tan(-135^\circ) = \boxed{1}$

$-135^\circ + 360^\circ = 225^\circ$

$\tan(-135^\circ) = \tan 225^\circ$

$= \frac{y}{x} \text{ at } 225^\circ$

$= \frac{-\sqrt{2}/2}{-\sqrt{2}/2} = 1$

9. $\tan \frac{11\pi}{2} = \boxed{\text{undefined}}$

$\frac{11\pi}{2} - \frac{4\pi}{2} = \frac{7\pi}{2}$

$\frac{7\pi}{2} - \frac{4\pi}{2} = \frac{3\pi}{2}$

$\tan \frac{11\pi}{2} = \tan \frac{3\pi}{2}$

$= \frac{y}{x} \text{ at } \frac{3\pi}{2}$

$= -\frac{1}{0}$

$= \text{undefined}$

10. $\cos \frac{-17\pi}{6} = \boxed{-\frac{\sqrt{3}}{2}}$

$2\pi = \frac{12\pi}{6}$

$\frac{-17\pi}{6} + \frac{12\pi}{6} = \frac{-5\pi}{6}$

$\frac{-5\pi}{6} + \frac{12\pi}{6} = \frac{7\pi}{6}$

$\cos \frac{-17\pi}{6} = \cos \frac{7\pi}{6}$

$= x \text{ at } \frac{7\pi}{6}$

$= -\frac{\sqrt{3}}{2}$

11. $\sin \frac{14\pi}{3} = \boxed{\frac{\sqrt{3}}{2}}$

$2\pi = \frac{6\pi}{3}$

$\frac{14\pi}{3} - \frac{6\pi}{3} = \frac{8\pi}{3}$

$\frac{8\pi}{3} - \frac{6\pi}{3} = \frac{2\pi}{3}$

$\sin \frac{14\pi}{3} = \sin \frac{2\pi}{3}$

$= y \text{ at } \frac{2\pi}{3}$

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