Printout

Thursday, March 9, 2017 8:38 AM

Precalculus
5.3-5.4 Partner Practice

Name:
Period:

(#1-2) Evaluate using a half-angle identity:

1. $\tan(-15^\circ)$.

$\tan \frac{-30}{2}$

$$\frac{1-\cos(-30)}{\sin(-30)} = \frac{1-\frac{\sqrt{3}}{2}}{-\frac{1}{2}}$$

$$\boxed{-2+\sqrt{3}}$$

2. $\cos\left(\frac{11\pi}{12}\right)$.

cos is ⊝

$\cos \frac{11\pi/6}{2}$

$$-\sqrt{\frac{1+\cos 11\pi/6}{2}}$$

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

3. Find all solutions to the equation $\cos 2x = \sin x$ in the interval $[0, 2\pi)$.

$$\cos 2x - \sin x = 0$$

$$1 - 2\sin^2 x - \sin x = 0$$

$$-(2\sin^2 x + \sin x - 1) = 0$$

$$-(2\sin x - 1)(\sin x + 1) = 0$$

$\sin x = 1/2$ $\sin x = -1$

$$\boxed{\frac{\pi}{6}, \frac{5\pi}{6}, \frac{3\pi}{2}}$$

4. Find all solutions to the equation $\sin 2x - 2\sin x = 0$ in the interval $[0, 2\pi)$.

$$2\sin x\cos x - 2\sin x = 0$$

$$2\sin x(\cos x - 1) = 0$$

$\sin x = 0$ $\cos x = 1$

$$\boxed{0, \pi}$$

5. Find all solutions to the equation $\cos 2x + \cos x = 0$ in the interval $[0, 2\pi)$.

$$2\cos^2 x - 1 + \cos x = 0$$

$$2\cos^2 x + \cos x - 1 = 0$$

$$(2\cos x - 1)(\cos x + 1)$$

$\cos x = 1/2$ $\cos x = -1$

$$\boxed{\pi, \frac{\pi}{3}, \frac{5\pi}{3}}$$

(#6-7) Prove the following:

6. $\sin(x-\pi) = -\sin x$

$\sin x \cdot \cos\pi - \cos x \cdot \sin\pi$

$\downarrow$ -1 $\qquad$ $\downarrow$ 0

$\boxed{-\sin x}$

7. $\tan(x+\frac{\pi}{4}) = \frac{1+\tan x}{1-\tan x}$

$$\frac{\tan x + \tan\frac{\pi}{4}}{1 - \tan x \cdot \tan\frac{\pi}{4}}$$

1 1

$$\boxed{\frac{1+\tan x}{1-\tan x}}$$

(#8-11) Prove the following: without using Identity

8. $\cos 2x = 1 - 2\sin^2 x$

$\cos(x+x)$

$\cos x \cdot \cos x - \sin x \cdot \sin x$

$\cos^2 x - \sin^2 x$

$\downarrow$

$1 - \sin^2 x$

$\boxed{1 - 2\sin^2 x}$

9. $\frac{1}{4}\sin 4x = \sin x\cos^3 x - \cos x \sin^3 x$

$\frac{1}{4}(\sin 2(2x))$

$\frac{1}{\cancel{4}_2}(\cancel{2}\sin 2x \cos 2x)$

$\frac{1}{\cancel{2}}(\cancel{2}\sin x\cos x)(\cos^2 x - \sin^2 x)$

$\boxed{\sin x\cos^3 x - \cos x\sin^3 x}$

10. $\sin 6x = 2\sin 3x\cos 3x$

$\sin(3x+3x)$

$\sin 3x \cdot \cos 3x + \cos 3x \cdot \sin 3x$

$\boxed{2\sin 3x \cdot \cos 3x}$

or

$\sin 2(3x)$

$\vdots$

$\boxed{2\sin 3x\cos x}$

11. $\cos 4x = 1 - 8\sin^2 x\cos^2 x$

$\cos 2(2x)$

$1 - 2\sin^2 2x$

$1 - 2(\sin 2x \cdot \sin 2x)$

$1 - 2(2\sin x \cdot \cos x \cdot 2\sin x\cos x)$

$\boxed{1 - 8\sin^2 x\cos^2 x}$