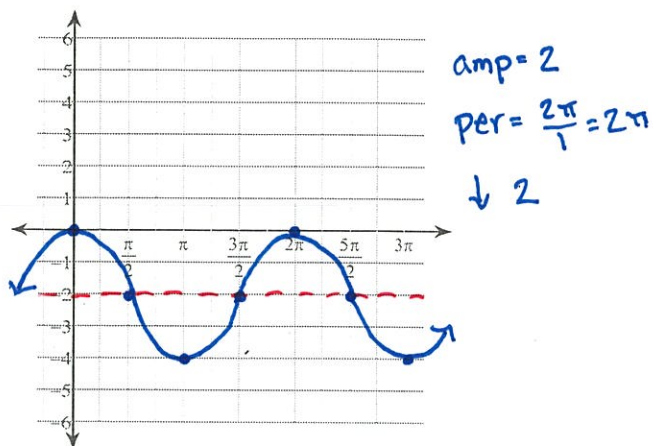


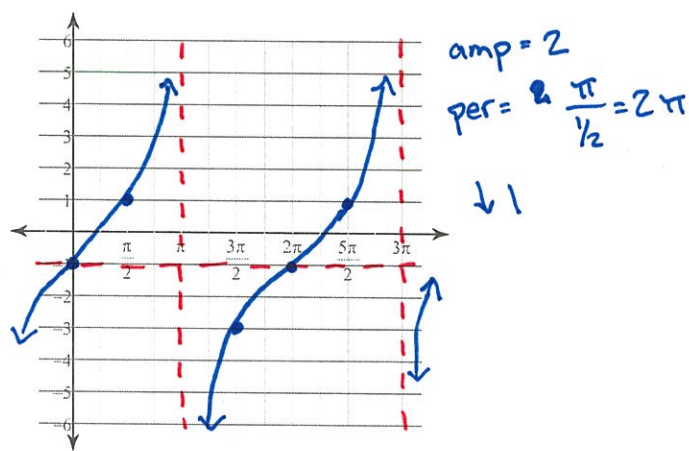
Unit 2 Practice Exam

Graph each function using radians.

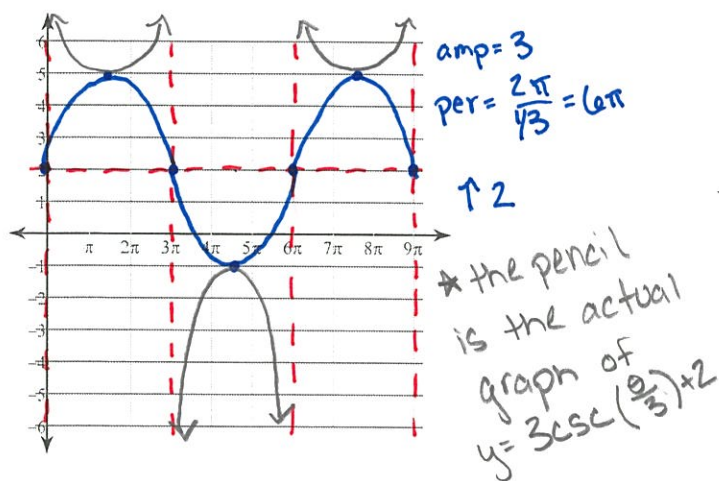
1) $y = -2 + 2\cos \theta$



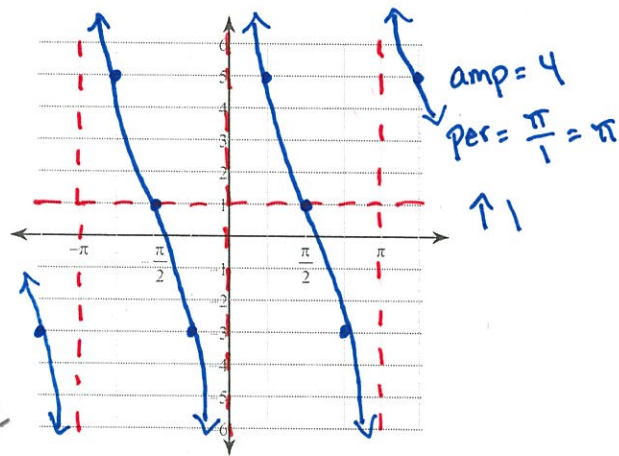
2) $y = 2\tan \frac{\theta}{2} - 1$



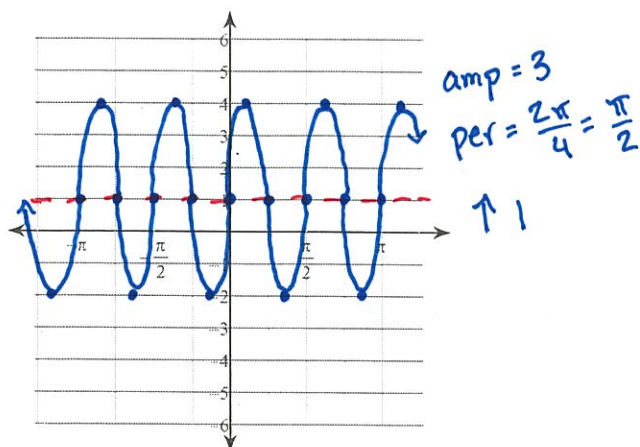
3) $y = 3\csc \frac{\theta}{3} + 2$



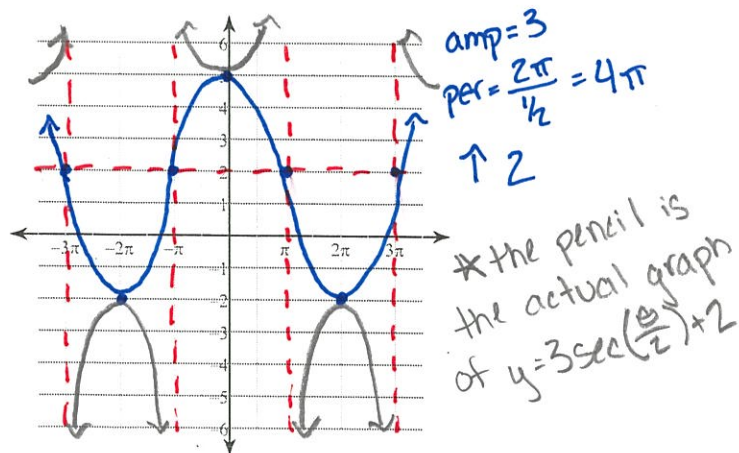
4) $y = 4\cot \theta + 1$



5) $y = 3\sin 4\theta + 1$



6) $y = 3\sec \frac{\theta}{2} + 2$



Solve each equation for $0 \leq \theta < 2\pi$.

$$7) -2 = -4 - \csc \theta$$

$$\frac{2}{-1} = \frac{-\csc \theta}{-1}$$

$$-2 = \csc \theta$$

$$-\frac{1}{2} = \sin \theta$$

$$\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$9) 1 = -2\sin^2 \theta + 2$$

$$\frac{-1}{-2} = \frac{-2\sin^2 \theta}{-2}$$

$$\sqrt{\frac{1}{2}} = \sqrt{\sin^2 \theta}$$

$$\pm \frac{1}{\sqrt{2}} = \pm \frac{\sqrt{1}}{\sqrt{2}} = \sin \theta$$

$$\downarrow$$

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

$$\theta = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

$$11) -1 + \cos \theta - 2\cos^2 \theta = -4\cos^2 \theta$$

$$+4\cos^2 \theta \quad +4\cos^2 \theta$$

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

$$(2\cos \theta - 1)(\cos \theta + 1) = 0$$

$$2\cos \theta - 1 = 0$$

$$\cos \theta = \frac{1}{2}$$

$$\theta = \frac{\pi}{3}, \frac{5\pi}{3}$$

$$\cos \theta + 1 = 0$$

$$\cos \theta = -1$$

$$\theta = \pi$$

$$8) \frac{3\sec^2 \theta}{3} = \frac{4}{3}$$

$$\sqrt{\sec^2 \theta} = \sqrt{\frac{4}{3}}$$

$$\sec \theta = \pm \sqrt{\frac{4}{3}} = \pm \frac{\sqrt{4}}{\sqrt{3}} = \pm \frac{2}{\sqrt{3}}$$

$$\cos \theta = \pm \frac{\sqrt{3}}{2}$$

$$\theta = \frac{\pi}{6}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{11\pi}{6}$$

$$10) 3\tan^2 \theta = 4\tan^2 \theta + \sqrt{3}\tan \theta$$

$$-3\tan^2 \theta \quad -3\tan^2 \theta$$

$$0 = \tan^2 \theta + \sqrt{3}\tan \theta$$

$$0 = \tan \theta (\tan \theta + \sqrt{3})$$

$$\tan \theta = 0$$

$$\theta = 0, \pi$$

$$\tan \theta + \sqrt{3} = 0$$

$$\tan \theta = -\sqrt{3}$$

$$\theta = \frac{2\pi}{3}, \frac{5\pi}{3}$$

$$12) -3\tan \theta \csc \theta - \csc \theta = -2\sqrt{3}\tan \theta - \csc \theta$$

$$+2\sqrt{3}\tan \theta \quad +2\sqrt{3}\tan \theta$$

$$2\sqrt{3}\tan \theta - 3\tan \theta \csc \theta = 0$$

$$\tan \theta (2\sqrt{3} - 3\csc \theta) = 0$$

$$\tan \theta = 0$$

$$\theta = 0, \pi$$

$$2\sqrt{3} - 3\csc \theta = 0$$

$$-3\csc \theta = -2\sqrt{3}$$

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

$$\theta = \frac{\pi}{3}, \frac{2\pi}{3}$$

Find the exact value of each expression.

13) $\tan^{-1} \frac{\sqrt{3}}{3}$

$-\frac{\pi}{6}$

15) $\tan^{-1} \frac{\sqrt{3}}{3}$

$\frac{\pi}{6}$

17) $\sin^{-1} -1$

$-\frac{\pi}{2}$

19) $\cos^{-1} \frac{\sqrt{2}}{2}$

$\frac{3\pi}{4}$

21) $\cos^{-1} \left(\tan \frac{\pi}{4} \right)$

$\cos^{-1}(1)$

0

~~23) $\sin \sin^{-1} \frac{2\sqrt{5}}{5}$~~

14) $\tan^{-1} 0$

0

16) $\sin^{-1} 0$

0

18) $\cos^{-1} 0$

$\frac{\pi}{2}$

20) $\tan^{-1} \sqrt{3}$

$\frac{\pi}{3}$

22) $\tan^{-1} \left(\cot \frac{\pi}{6} \right)$

$\tan^{-1}(\sqrt{3})$

$\frac{\pi}{3}$

~~24) $\sec \tan^{-1} \frac{\sqrt{2}}{4}$~~

~~25) $\csc \tan^{-1} \frac{4\sqrt{209}}{209}$~~

26) $\cos^{-1} \left(\cos \frac{\pi}{4} \right)$

$\cos^{-1} \left(\frac{\sqrt{2}}{2} \right)$

$\frac{\pi}{4}$

~~27) $\csc \tan^{-1} (2\sqrt{2})$~~

~~28) $\cos \sin^{-1} \frac{\sqrt{5}}{5}$~~