Name:_____ Date:_____

Section 3.5 Cosecant Secant and Cotangent Functions

1. Determine each value to 3 decimal places:

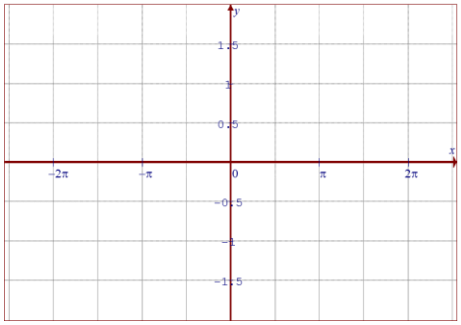
a) $\csc 110°$	b) $\cot 130°$	c) $\sec 95°$	d) $\csc 64°$
e) $\cot 233°$	f) $\sec 100°$	g) $\cot 45°$	h) $\sec 112°$

2. Determine the exact value of each of the following without a calculator

a) $\csc 45°$	b) $\cot 180°$	c) $\sec 60°$	d) $\csc 135°$
e) $\cot \frac{\pi}{3}$	f) $\sec \frac{2\pi}{3}$	g) $\cot 225°$	h) $\csc 300°$
i) $\sec \frac{11\pi}{6}$	j) $\cot \frac{4\pi}{3}$	k) $\csc \pi$	L) $\sec \frac{5\pi}{6}$

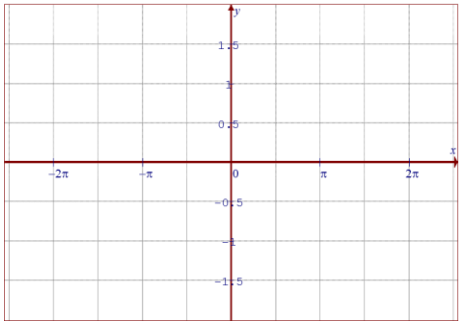
3. Graph the following function for $-2\pi \le \theta \le 2\pi$. Indicate the Period, Amplitude, Domain, and Range:

i) $y = \csc x$



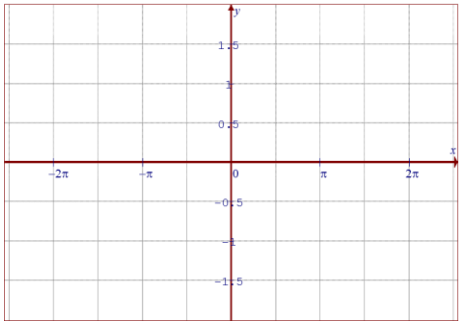
Period: Amplitude:
Domain: Range:

ii) $y = \sec x$



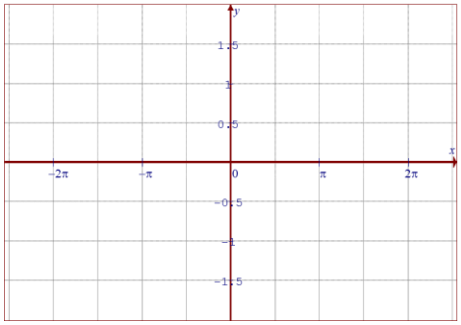
Period: Amplitude:
Domain: Range:

iii) $y = \cot x$



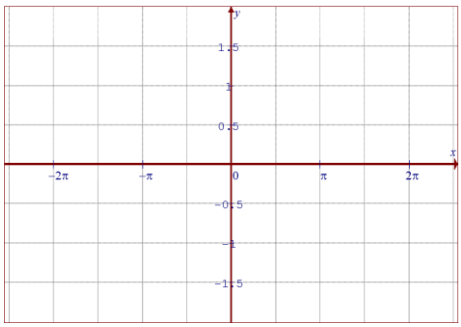
Period: Amplitude:
Domain: Range:

iv) $y = -\csc x$



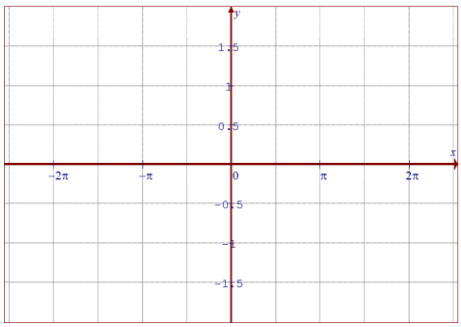
Period: Amplitude:
Domain: Range:

v) $y = -\sec x - 0.5$



Period: Amplitude:
Domain: Range:

vi) $y = -\cot x + 0.5$



Period: Amplitude:
Domain: Range:

14. Simplify the following in terms of "sine" and "cosine" only:

a) $(\sec x \csc x - \cot x)(\sin x - \csc x)$	b) $\dfrac{\dfrac{\cot x + 1}{\cot x} - 1}{\dfrac{\cot x - 1}{\cot x} - 1}$
c) $\cot x + \tan x$	d) $\dfrac{\csc^2 x + \sec^2 x}{\csc x \sec x}$
e) $\sec A \sqrt{\dfrac{1 - \sin^2 B \sin^2 A}{1 + \cos^2 A \tan^2 B}}$	f) $\dfrac{\sec x}{\tan x + \cot x}$

4. Indicate the general formula for the vertical asymptotes of $y = \cot x$

5. Given each expression, calculate the value of θ for $0 < \theta < 2\pi$

a) $\csc\theta = -2$	b) $\sec\theta = \dfrac{2\sqrt{3}}{3}$	c) $\cot^2\theta = 1$	d) $3\csc\theta = -2\sqrt{3}$
e) $\cot\theta = -\sqrt{3}$	f) $\sec\theta = \infty$	g) $\cot\theta = 0$	h) $\csc\theta = -1$

i) $6\sec\theta = 4\sqrt{3}$	j) $3\csc\theta + 2\sqrt{3} = 0$	k) $\tan\theta - \sqrt{3} = 0$	L) $\sqrt{3}\sec\theta + 2 = 0$
m) $2\csc^2\theta - 1 = 3$	n) $\tan^2\theta = 9$	o) $\cos^2\theta - \cos\theta - 2 = 0$	p) $\dfrac{-2}{\csc\theta} + \csc\theta = 1$

6. Given that $\sin^2\theta + \cos^2\theta = 1$ and $\tan^2\theta = 1.25$, what is the value of $\sec^2\theta$?

7. If θ is an angle whose measure is not an integer multiple of $90°$, prove that $\cot\theta - \cot 2\theta = \dfrac{1}{\sin 2\theta}$

8. Simplify the following expression: $\dfrac{\sec A - \cos A}{\tan A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

9. Simplify the following expression: $\dfrac{1 + \sec A}{\tan A + \sin A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

10. Simplify the following expression: $\dfrac{\tan A + \cot A}{\sec A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

11. Simplify the following expression: $\dfrac{1+\sin A}{1+\csc A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

12. Simplify the following expression: $\dfrac{1+\sec A}{1+\cos A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

13. Simplify the following expression: $\dfrac{1+\cot A}{1+\tan A}$

a) $\sin A$ b) $\cos A$ c) $\sec A$ d) $\csc A$ e) $\cot A$

14. Prove that both sides of the equation are equal: $\dfrac{\sin A+\cos A\cot A}{\cos A\csc A}=\sec A$

15. Prove that both sides of the equation are equal: $\dfrac{1-\cos A}{\sin A}=\dfrac{1}{\csc A+\cot A}$

16. Challenge: What are all the values of "x" between 0 *and* 2π that satisfy the equation?

$\left(5+2\sqrt{6}\right)^{\sin x}+\left(5-2\sqrt{6}\right)^{\sin x}=2\sqrt{3}$