

Name: _____

Date: _____

Math 10/11 Honors: Section 4.7 Cosecant Secant and Cotangent Functions

1. Determine each value to 3 decimal places:

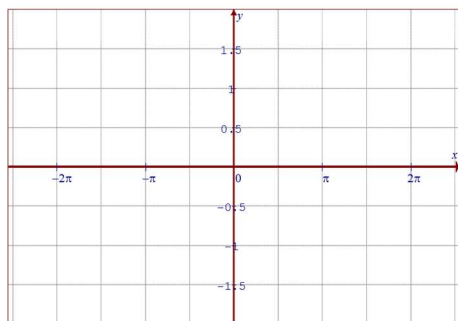
a) $\csc 110^\circ$	b) $\cot 130^\circ$	c) $\sec 95^\circ$	d) $\csc 64^\circ$
e) $\cot 233^\circ$	f) $\sec 100^\circ$	g) $\cot 45^\circ$	h) $\sec 112^\circ$

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

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

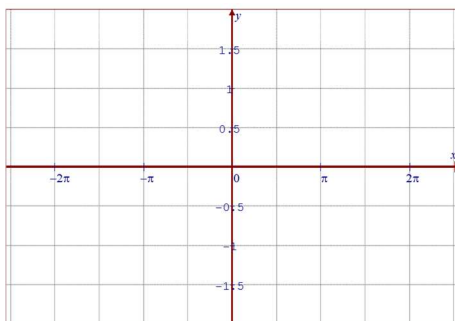
3. Graph the following function for $-2\pi \leq \theta \leq 2\pi$. Indicate the Period, Amplitude, Domain, and Range:

i) $y = \csc x$



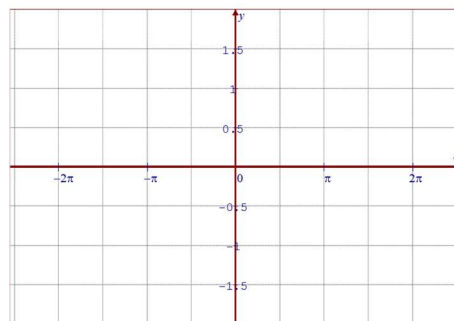
Period: Amplitude:
Domain: Range:

ii) $y = \sec x$



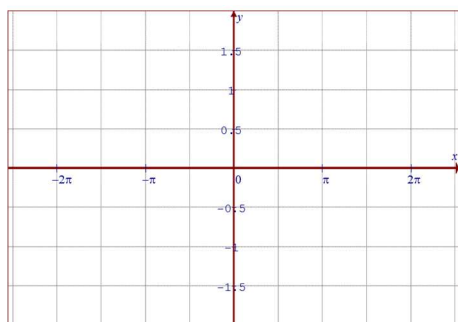
Period: Amplitude:
Domain: Range:

iii) $y = \cot x$



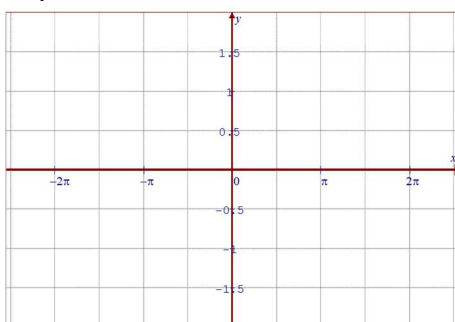
Period: Amplitude:
Domain: Range:

iv) $y = -\csc x$



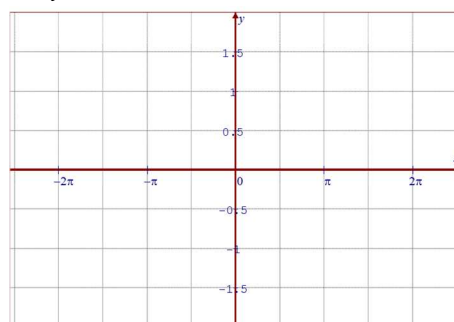
Period: Amplitude:
Domain: Range:

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



Period: Amplitude:
Domain: Range:

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



Period: Amplitude:
Domain: Range:

4. Simplify the following in terms of “sine” and “cosine” only:

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

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

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

a) $\csc \theta = -2$	b) $\sec \theta = \frac{2\sqrt{3}}{3}$	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) $\frac{-2}{\csc \theta} + \csc \theta = 1$

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

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

9. Simplify the following expression: $\frac{\sec A - \cos A}{\tan A}$

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

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

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

11. Simplify the following expression: $\frac{\tan A + \cot A}{\sec A}$

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

12. Simplify the following expression: $\frac{1 + \sin A}{1 + \csc A}$

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

13. Simplify the following expression: $\frac{1 + \sec A}{1 + \cos A}$

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

14. Simplify the following expression: $\frac{1 + \cot A}{1 + \tan A}$

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

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

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

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

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