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9.	Amplitude = $\frac{1}{2}$	Period = π	Phase Shift = 0	Vertical Shift = 0
$\frac{2\pi}{b} = \pi \Rightarrow b = 2$ $0 = -\frac{c}{2} \Rightarrow c = 0$ $y = 0 \pm \frac{1}{2} \cos(2x + 0)$				
10.	Amplitude = 5	Period = 3	Phase Shift = -1	Vertical Shift = -4
$\frac{2\pi}{b} = 3 \Rightarrow b = \frac{2\pi}{3}$ $-\frac{c}{\frac{2\pi}{3}} = -1 \Rightarrow c = \frac{2\pi}{3}$ $y = -4 \pm 5 \cos(\frac{2\pi}{3}x + \frac{2\pi}{3})$				
11.	Amplitude = 1	Period = $\frac{\pi}{4}$	Phase Shift = 1	Vertical Shift = -2
$\frac{2\pi}{b} = \frac{\pi}{4} \Rightarrow b = 8$ $-\frac{c}{8} = 1 \Rightarrow c = -8$ $y = -2 \pm \cos(8x - 8)$				

State the amplitude, period, phase shift, asymptotes and vertical shift for each of the following.

12. $y = \frac{1}{2} \sec(\frac{x}{3})$	Amplitude: none	Period: 6π	Phase Shift: 0	Vertical Shift: 0	Asymptotes:
Key Points: $(0, \frac{1}{2}), (2\pi, 0), (4\pi, \frac{1}{2}), (6\pi, 0)$	Graph:				
13. $y = 1 + 2 \csc(\pi x - 3)$	Amplitude: none	Period: 2	Phase Shift: $\frac{3}{\pi}$	Vertical Shift: 1	Asymptotes: $x = \frac{3}{\pi}, x = \frac{3}{\pi} + 1, x = \frac{3}{\pi} + 2$
Key Points: $(\frac{3}{\pi}, 1), (\frac{3}{\pi} + \frac{1}{2}, 3), (\frac{3}{\pi} + 1, 1), (\frac{3}{\pi} + \frac{3}{2}, -1)$	Graph:				
14. $y = 3 - 2 \sec(\frac{\pi}{2}x + \frac{\pi}{4})$	Amplitude: none	Period: 4	Phase Shift: $-\frac{1}{2}$	Vertical Shift: 3	Asymptotes: $x = \frac{1}{2}, x = \frac{5}{2}$
Key Points: $(-\frac{1}{2}, 1), (\frac{1}{2}, 5), (\frac{3}{2}, 1), (\frac{5}{2}, -1)$	Graph:				

Write the equation of the trigonometric function for the given graph.

15.	16.
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Pythagorean Identities: $\sin^2 \theta + \cos^2 \theta = 1$ $\tan^2 \theta + 1 = \sec^2 \theta$ $1 + \cot^2 \theta = \csc^2 \theta$	Co-function Identities: $\cos(\frac{\pi}{2} - x) = \sin x$ $\sin(\frac{\pi}{2} - x) = \cos x$ $\tan(\frac{\pi}{2} - x) = \cot x$ $\cot(\frac{\pi}{2} - x) = \tan x$	Periodicity Identities: $\sin(x + 2\pi) = \sin x$ $\cos(x + 2\pi) = \cos x$ $\tan(x + \pi) = \tan x$ $\csc(x + 2\pi) = \csc x$ $\sec(x + 2\pi) = \sec x$ $\cot(x + \pi) = \cot x$
Reciprocal Identities: $\csc x = \frac{1}{\sin x}$ $\sec x = \frac{1}{\cos x}$ $\cot x = \frac{1}{\tan x}$	Even-odd Identities: $\sin(-x) = -\sin x$ $\cos(-x) = \cos x$ $\tan(-x) = -\tan x$	Sum and difference formulas: $\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$ $\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$ $\tan(x \pm y) = \frac{\sin(x \pm y)}{\cos(x \pm y)}$
Product-to-sum formulas: $\sin x \sin y = \frac{1}{2} [\cos(x-y) - \cos(x+y)]$ $\cos x \cos y = \frac{1}{2} [\cos(x-y) + \cos(x+y)]$ $\sin x \cos y = \frac{1}{2} [\sin(x+y) + \sin(x-y)]$ $\cos x \sin y = \frac{1}{2} [\sin(x+y) - \sin(x-y)]$	Half-angle formulas: $\sin(\frac{\theta}{2}) = \pm \sqrt{\frac{1 - \cos \theta}{2}}$ $\cos(\frac{\theta}{2}) = \pm \sqrt{\frac{1 + \cos \theta}{2}}$ $\tan(\frac{\theta}{2}) = \frac{1 - \cos \theta}{\sin \theta}$	Law of sines: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ Law of cosines: $a^2 = b^2 + c^2 - 2bc \cos A$ $A = \cos^{-1}(\frac{b^2 + c^2 - a^2}{2bc})$
Sum-to-product: $\sin x \sin y = 2 \sin(\frac{x+y}{2}) \cos(\frac{x-y}{2})$ $\cos x \cos y = 2 \cos(\frac{x+y}{2}) \cos(\frac{x-y}{2})$ $\cos x - \cos y = -2 \sin(\frac{x+y}{2}) \sin(\frac{x-y}{2})$	Double-angle formulas: $\sin 2\theta = 2 \sin \theta \cos \theta$ $\cos 2\theta = \cos^2 \theta - \sin^2 \theta$ $\tan 2\theta = \frac{2 \tan \theta}{1 - \tan^2 \theta}$	Area of triangle: $\frac{1}{2} ab \sin C$ $\sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{1}{2}(a+b+c)$

TRIGONOMETRY FORMULAS

Angle Addition Formulas $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$ $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$ $\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$	Difference Formulas $\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$ $\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$ $\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$
Double Angle Formulas $\sin(2\theta) = 2 \sin \theta \cos \theta$ $\cos(2\theta) = \cos^2 \theta - \sin^2 \theta$ $= 1 - 2 \sin^2 \theta$ $= 2 \cos^2 \theta - 1$ $\tan(2\theta) = \frac{2 \tan \theta}{1 - \tan^2 \theta}$	Half Angle Formulas $\sin(\frac{\theta}{2}) = \pm \sqrt{\frac{1 - \cos \theta}{2}}$ $\cos(\frac{\theta}{2}) = \pm \sqrt{\frac{1 + \cos \theta}{2}}$ $\tan(\frac{\theta}{2}) = \frac{1 - \cos \theta}{\sin \theta}$
Product-to-Sum Formulas $\sin A \sin B = \frac{1}{2} [\cos(A-B) - \cos(A+B)]$ $\cos A \cos B = \frac{1}{2} [\cos(A-B) + \cos(A+B)]$ $\sin A \cos B = \frac{1}{2} [\sin(A+B) + \sin(A-B)]$ $\cos A \sin B = \frac{1}{2} [\sin(A+B) - \sin(A-B)]$	Sum-to-Product Formulas $\sin u + \sin v = 2 \sin(\frac{u+v}{2}) \cos(\frac{u-v}{2})$ $\sin u - \sin v = 2 \cos(\frac{u+v}{2}) \sin(\frac{u-v}{2})$ $\cos u + \cos v = 2 \cos(\frac{u+v}{2}) \cos(\frac{u-v}{2})$ $\cos u - \cos v = -2 \sin(\frac{u+v}{2}) \sin(\frac{u-v}{2})$
Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$	Law of Cosines SSS Form $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$ $\cos B = \frac{c^2 + a^2 - b^2}{2ca}$ $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$
Law of Cosines SAS Form $c^2 = a^2 + b^2 - 2ab \cos C$ $b^2 = c^2 + a^2 - 2ca \cos B$ $a^2 = b^2 + c^2 - 2bc \cos A$	Area of a Triangle (SAS) $\frac{ab \sin C}{2} = \frac{bc \sin A}{2} = \frac{ca \sin B}{2}$ Heron's Formula (SSS) $s = \frac{a+b+c}{2}$ $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$

Reciprocal $\csc x = \frac{1}{\sin x}$ $\sec x = \frac{1}{\cos x}$ $\cot x = \frac{1}{\tan x}$	Pythagorean $\sin^2 x + \cos^2 x = 1$ $1 + \tan^2 x = \sec^2 x$ $1 + \cot^2 x = \csc^2 x$	Negative Angle $\sin(-x) = -\sin x$ $\cos(-x) = \cos x$ $\tan(-x) = -\tan x$
Addition and Subtraction $\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$ $\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$ $\tan(x \pm y) = \frac{\sin(x \pm y)}{\cos(x \pm y)}$		
Periodicity $\sin(x + 2\pi) = \sin x$ $\cos(x + 2\pi) = \cos x$ $\tan(x + \pi) = \tan x$		
Product $\sin x \sin y = \frac{1}{2} [\cos(x-y) - \cos(x+y)]$ $\cos x \cos y = \frac{1}{2} [\cos(x-y) + \cos(x+y)]$ $\sin x \cos y = \frac{1}{2} [\sin(x+y) + \sin(x-y)]$ $\cos x \sin y = \frac{1}{2} [\sin(x+y) - \sin(x-y)]$		
Double Angle $\sin(2x) = 2 \sin x \cos x$ $\cos(2x) = \cos^2 x - \sin^2 x$ $\tan(2x) = \frac{2 \tan x}{1 - \tan^2 x}$		

