Pre-Calculus
2nd Quarter Study Guide 2018
I am _____
Today is_____in_____

Show all your work. Answers with no work will be given no credit. If you are using a calculator, make sure you show steps you put in the calculator.

Four of the mathematics teachers are outside in a variety of scenarios. Mr. Statler is 1000 feet from the base of the tower that Mr. Hickman is standing on top of, and Mr. Urbanc is flying in an airplane that is DIRECTLY ABOVE Mr. Hickman. Mr. Hickman knows that Mr. Urbanc is 5000 feet above him, but he does not know how tall the tower he is standing on is. Mrs. Robinson is in a hot air balloon DIRECTLY ABOVE Mr. Statler. Mr. Statler knows that the angle of elevation from a point on the ground at his feet to Mr. Hickman is 42°, and Mr. Urbanc knows that his angle of depression to Mrs. Robinson is 38°. Mr. Hickman does know that Mrs. Robinson's balloon is higher than his tower, but lower than Mr. Urbanc's airplane.

How tall is Mr. Hickman's tower?

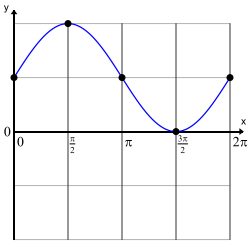
At what altitude is Mrs. Robinson flying?

What is the angle of depression from Mrs. Robinson to Mr. Hickman?

What is the angle of elevation from the point at Mr. Statler's feet to Mr. Urbanc's airplane.

Directions: Determine the equations of each of the graphs below

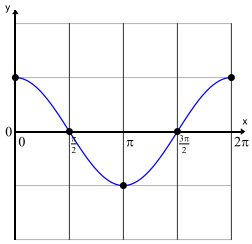
Graph 1



Equation of this graph

_____

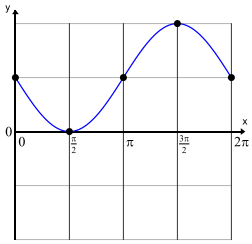
Graph 2



Equation of this graph

_____

Graph 3



Equation of this graph

_____

Write the equation for the asymptotes of $y = 2\sec(3x - \pi)$.

Find 4 x-intercepts of $y = -4\cot(4x - 2\pi)$

Find the value of the inverse trig function **<u>in radians</u>** without using a calculator.

$\arcsin(-\sqrt{2}/2)$

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

5. Find the exact value of the expression.

sin(arccos(3/8))

6. Write an algebraic expression equivalent to the expression.

cos(arccsc(3x))

Find the exact value of cos(165).

Find the exact value of tan($\frac{-17\pi}{12}$).

Use trigonometric identities, given tanx = -2, find cosx if x lies in Quadrant II.

Prove the following using the Pythagorean Theorem.

$\sin^2\Theta + \cos^2\Theta = 1$.

Prove the following identity.

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

$$\sec^2\theta = \sin\theta\tan\theta\sec\theta + \csc^2\theta\sin^2\theta$$

Given $sin\theta = -\frac{8}{17}$ and $cos\beta = \frac{5}{13}$, and θ is in Quadrant III and β is in Quadrant I. Find the following.

$\cos(\theta + \beta)$

Verify that $\cos(\pi + x) + \cos(\pi - x) = -2\cos x$

Rewrite the following as a trigonometric function of a single angle and evaluate.

$$\frac{(tan91 - tan46)}{(1 + tan91tan46)}$$

Determine two values of x that will satisfy the given equation USE DEGREE MEASURE

$$\frac{\tan 18 + \tan x}{1 - \tan 18 \tan x} = -\sqrt{3}$$

Find all solutions to the equation.

$\sqrt{2}\sin x + 1 = 0$

Find 2 solutions to the equation.

$3sin^2\theta - sin\theta = 2$

Verify that

$\sin(\pi + \beta) - \sin(\pi - \beta) = -2\sin\beta$

Solve $5\cos^2 x - 6\cos x = -1$ on [0,360)

Use identities to find sinx and tanx if $\cos x = -\frac{3}{5}$ and x is in Quadrant II.