

**ASSIGNMENT: Solving Trigonometric Equations****DIRECTIONS:** Solve trigonometric equations by utilizing trigonometric identities.

Ideally you want to compare apples to apples. Use greatest common factor or X-method factoring to make your equation appear more simple. Finally, set individually factored terms equal to zero and solve with the Unit Circle.

View the class notes webpage for worked examples.

3.1	Length of an arc Area of a sector	$l = \theta r$ $A = \frac{1}{2} \theta r^2$
3.2	Trigonometric identity	$\tan \theta = \frac{\sin \theta}{\cos \theta}$
3.3	Pythagorean identity Double angle formulae	$\cos^2 \theta + \sin^2 \theta = 1$ $\sin 2\theta = 2 \sin \theta \cos \theta$ $\cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$
3.6	Cosine rule  Sine rule  Area of a triangle	$c^2 = a^2 + b^2 - 2ab \cos C$ ; $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$  $A = \frac{1}{2} ab \sin C$

1.) Solve the equation  $2 = \tan^2 x + 2$  along the domain  $-\pi \leq x \leq \pi$ .

Solution(s) = \_\_\_\_\_

NAME: \_\_\_\_\_

DATE: 04/14/15

2.) A tide can be modeled by the function  $h(t) = 6 \cos \frac{2\pi}{12.2} (t - 4) + 8$ , where “h” is the height of the water in meters, and “t” is the number of hours past midnight.

Determine the time of day, to the nearest minute, when the tide first attains a height of 4m.

Time = \_\_\_\_\_

3.) Solve the following:  $\frac{1}{2} = 2 - 2 \sin^2 x$  for  $180^\circ \leq x \leq 360^\circ$ .

Solution(s) = \_\_\_\_\_

4.) Solve the equation  $8 \cos^3 x = -8$  for  $0 \leq x \leq \pi$ .

Solution(s) = \_\_\_\_\_

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**Answer key: ensure you show all work. I grade for correct work and calculations. If you use the calculator, tell me which inputs and functions you used to arrive at your answer.**

1.) 0,  $\pi$ ,  $-\pi$

2.) 8:28am

3.)  $240^\circ$ ,  $300^\circ$

4.)  $\pi$