Homework Sheet: **PRECALC . – SOLVING TRIGONOMETRIC EQUATIONS –**

1. FIND ALL SOLUTIONS, IN RADIANS, OF EACH OF THE GIVEN EQUATIONS.

   a. $12\sin\theta - 7 = 0$

   b. $5\cos\theta + 2 = 0$

   c. $3\tan\theta = 8$

2. FIND ALL VALUES OF θ, SUCH THAT $0° \le \theta < 360°$, THAT SATISFY EACH OF THE GIVEN EQUATIONS. (Note interval – find reference angle and then determine which quadrants the answer will be in.)

   a. $\tan\theta = -1.2985$

   b. $\cos\theta = 0.5568$

   c. $\sin\theta = -0.3537$

3. FIND ALL VALUES OF x, SUCH THAT $0 \le x < 2\pi$, THAT SATISFY EACH OF THE GIVEN EQUATIONS. WHEN POSSIBLE, GIVE THE EXACT VALUE OF x. (Note interval – find reference angle and then determine which quadrants the answer will be in.)

a. $\sin^2 x - 2\sin x = 3$

b. $\cos^2 x + 2 = 3\cos x$

c. $6\sin^2 x - \sin x - 1 = 0$

d. $2\cos^2 x - \cos x - 1 = 0$

e. $2\cos^2 x - 1 = 0$

f. $2\sin^2 x = 2 - 3\sin x$

NORTH HUNTERDON HIGH SCHOOL
PRECALCULUS I

PRACTICE – GENERAL SOLUTIONS TO TRIGONOMETRIC EQUATIONS

A. Find the general solutions for the following: $0 \le x < 360$

1. $2\sin x - 1 = 0$
2. $\sin x + \sqrt{2} = -\sin x$
3. $\sqrt{3}\cos x + 1 = 0$
4. $4\cos^2 x - 3 = 0$
5. $3\tan^2 x - 9 = 0$
6. $2\cos^2 x - \cos x - 3 = 0$

B. Solve the trigonometric equation for the interval $0 \le x \le 2\pi$.

7. $5+2\sin x = 7$

8. $3\tan x + \sqrt{3} = 0$

9. $3\cos x = \cos x - 1$

10. $4\cos^2 x - 1 = 0$

11. $5\tan^2 x - 15 = 0$

12. $2\sin^2 x - 1 = 0$

5.3 Solving Trig Equations Practice Worksheet #1
Pre-calculus

Name: _____
Date: _____ Block: ____

Solve for the unknown variable on the interval $0 \le x < 2\pi$.

1. $4\cos^2 x - 3 = 0$

2. $\sqrt{2}\sin 2x = 1$

3. $3\cot^2 x - 1 = 0$

4. $\cos^3 x = \cos x$

5. $\sin x - 2\sin x\cos x = 0$

6. $2\sin^2 x - \sin x - 3 = 0$

7. $\csc^2 x - \csc x - 2 = 0$

8. $\cos^2 x = 1 - \sin x$

Solve for the unknown variable on the given interval.

9. $\sqrt{3} + \tan(2x) = 0$ on $[0, 2\pi)$.

10. $\cos(\pi x) = 0.5$ on $[0, 2)$.

11. $\sin\left(\frac{x}{2}\right) - 1 = 0$ on $[0, 8\pi)$.

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5.3 Solving Trig Equations – Worksheet #2
Pre-calculus

Name: _____
Date: _____ Block: ___

Part 1: Solve for the unknown variable. Give all of the exact general solutions.

1. $\sin\theta = \frac{\sqrt{2}}{2}$

2. $\cos\theta = \sin\theta$

3. $\tan\theta = 1$

4. $1 + \sin\theta = 2\cos^2\theta$

5. $2\cos^2\theta + \cos\theta = 0$

6. $\sin 3\theta = -1$

7. $\sin^2\theta - 1 = 0$

8. $\cos 2\theta = ½$

9. $2\sin^2\theta - \sin\theta - 1 = 0$

10. $\tan 4\theta = -1$

11. $\tan^2 3x = 3$

12. $\cos\frac{x}{2} = \frac{\sqrt{2}}{2}$

Part 2: Solve by approximating the solutions on the interval [0,2π).

13. $2\sin^2 x + 3\sin x + 1 = 0$

14. $4\sin^2 x = 2\cos x + 1$

15. $\csc x + \cot x = 1$

16. $\dfrac{\cos x \cot x}{1 - \sin x} = 3$

17. $\sec^2 x + 0.5\tan x = 1$

Part 3: Use the calculator's inverse trig functions to approximate the solutions. Remember that you must also find the other solution by either adding π, subtracting the value from π, or subtracting the value from 2π.

18. $\tan\theta = 4$

19. $\cos\theta = 0.84$

20. $\sin\theta = 0.63$

Solving Trigonometric Equations and Inequalities HOMEWORK

1. Determine all solutions to the following equations (exact)

a. $\sin x = -1$

b. $\sec x = 2$

c. $\cot x = 0$

d. $\tan x = -\frac{\sqrt{3}}{3}$

2. Determine all solutions to the following equations (approximate)

a. $\cos x = 0.9224$

b. $\cot x = -7.770$

3. Determine all solutions to the following over the interval $0 \le x < 2\pi$ (without calculator)

a. $1 - 3\tan^2 x = 0$

b. $\csc^2 x + \csc x - 2 = 0$

c. $2\sin x + \csc x = 0$

d. $4\sec x \cos x = 1$

e. $\sin 2x \sin x - \cos x = 0$

f. $\sec^2 x + 2 = 3\sec x$

4. Determine all solutions over the interval $0 \le x < 2\pi$ (with calculator)

a. $\sin^2 x = 20 - \sin x$

b. $2\tan^2 x + 7\tan x = 15$

c. $3\sin^2 x - \cos^2 x = 1$

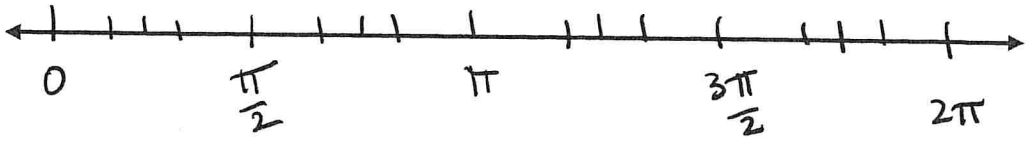
d. $\cos 2x = 2\sin^2 x - 2$

e. $\sec^2 x = 6\sec x + 2$

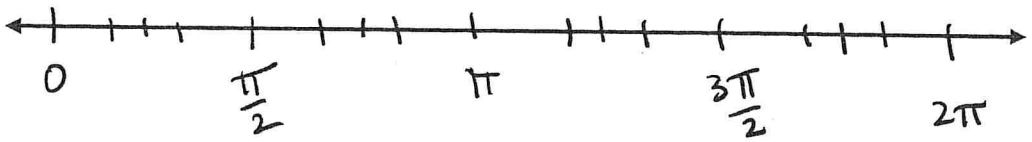
f. $4\cot^2 x - 4\cot x = 3$

5. On the interval $0 \le x < 2\pi$, determine where:

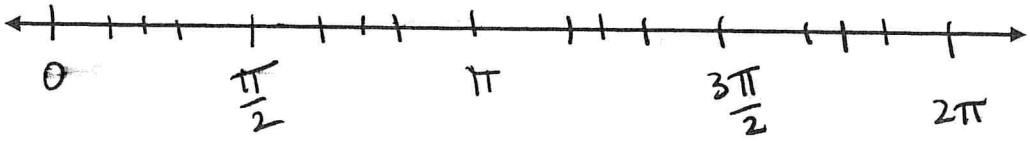
a. $\cos^2 x - 2\cos x < 0$



b. $\cos 2x + 7\sin x - 4 > 0$



c. $4\sin^2 x - 3 \ge 0$



Precalculus* Worksheet
Solving Trig Inequalities

Name_____

In problems 1 – 4, use the sign chart method to find the solutions of each inequality if $0 \le x < 2\pi$.

1. $2\sin^2 x + \sin x - 1 < 0$

2. $2\cos^2 x + 3\cos x - 2 \ge 0$

3. $2\sin^2 x + 3\sin x \ge 2$

4. $\sin 2x < \sin x$

In problems 5 – 8 use a graphical method to find the solutions of each inequality if $0 \le x < 2\pi$. Label the graph(s) and each important point.

5. $2\sin x + \sqrt{3} \le 0$

6. $\tan^2 x < 1$

7. $\cos x \le \sin x$

8. $\cot^2 x + \csc x + 1 \ge 0$