

**MATH 1700: SECTION 11.4: SOLVING EQUATIONS AND INEQUALITIES:**

**EXAMPLE 1:** Solve the following analytically and list the solutions which lie in the interval  $[0, 2\pi)$ .

1.  $\cos(2\theta) = -\frac{\sqrt{3}}{2}$

2.  $\csc\left(\frac{1}{3}\theta - \pi\right) = \sqrt{2}$

3.  $\cot(3t) = 0$

4.  $\sec^2(t) = 4$

5.  $\tan\left(\frac{x}{2}\right) = -3$

6.  $\sin(2x) = 0.87$

**EXAMPLE 2:** Solve the following analytically and list the solutions which lie in the interval  $[0, 2\pi)$ .

1.  $3 \sin^3(\theta) = \sin^2(\theta)$

2.  $\sec^2(\theta) = \tan(\theta) + 3$

3.  $\cos(2t) = 3 \cos(t) - 2$

4.  $\cos(3t) = 2 - \cos(t)$

**EXAMPLE 3:** Solve the following equations analytically and list the solutions which lie in the interval  $[0, 2\pi)$ .

1.  $\sin(2x) = \sqrt{3} \cos(x)$

2.  $\sin(x) \cos\left(\frac{x}{2}\right) + \cos(x) \sin\left(\frac{x}{2}\right) = 1$

3.  $\cos(x) - \sqrt{3} \sin(x) = 2$

4.  $\cos(3x) = \cos(5x)$

**EXAMPLE 4:** Solve the following equations analytically.

1.  $\arcsin(2x) = \frac{\pi}{3}$

2.  $4 \arccos(t) - 3\pi = 0$

3.  $4 \arctan^2(t) - 3\pi \arctan(t) - \pi^2 = 0$