

Trigonometric Equations — 8.7 and 8.8

Tips for Solving Trigonometric Equations

1. Use the unit circle to find angles between $[0, 2\pi)$ that satisfy the equation.
2. Sine, cosine, cosecant and secant all have a period of 2π .
3. Tangent and cotangent have a period of π .
4. If the equation has more than one trigonometric function (or a single trigonometric function raised to a power), try getting a zero on one side and factoring.
5. Remember that you may use identities to get an equation in terms of only one trigonometric function.
6. The arguments of the trigonometric functions usually need to be consistent (the same). This will come up in 7.3 & 7.4.

Find all solutions of the equation.

1. $\sin x = -\frac{1}{2}$

2. $\csc \theta \sin \theta = 1$

3. $\cos \frac{1}{4}x = -\frac{\sqrt{2}}{2}$

4. $3 - \tan^2\left(x - \frac{\pi}{2}\right) = 0$

5. $(\sin t - 1)\cos t = 0$

6. $\sec\theta \csc\theta = 2 \csc\theta$

7. $\sqrt{3} \sin t + \cos t = 1$

8. $2 \sin t \csc t - \csc t = 4 \sin t - 2$

Approximate, to the nearest $10'$, the solutions of the equation in the interval $[0^\circ, 360^\circ)$.

9. $\cos^2 t - 4 \cos t + 2 = 0$