

Solve each equation for  $\theta$  or  $x$  as indicated, where  $0^\circ \leq \theta \leq 360^\circ$  and  $0\pi \leq x \leq 2\pi$ .

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


2.  $\sin 2\theta = -\sin \theta$

3.  $\sin x + \cos x = 0$

4.  $2 \tan^2 \theta - 3 \sec \theta = 0$

Solve each equation for **ALL** values of  $\theta$  or  $x$  as indicated.

5.  $\tan^2 x + 2 \tan x = -1$

 6.  $\sin^2 2\theta - \cos^2 \theta = 0$  (Hint: write  $\sin^2 2\theta$  as  $\sin 2\theta \sin 2\theta$  then use the double-angle identity)



The equation  $T(x) = 19 \sin 30(\theta - 3) + 53$  models the temperature of the water in a lake, where  $T(x)$  is the temperature in degrees Fahrenheit and  $\theta$  is months ( $\theta = 1$ ) is January.

7. What is the temperature of the water in October?

8. What two months are likely to give a temperature of  $62.4^\circ$  ?

Multiple Choice.

9. Solve.  $\sqrt{3} + 2 \sin x = 0$ , where  $0 \leq x \leq 2\pi$ .

a.  $\frac{2\pi}{3}, \frac{4\pi}{3}$

b.  $\frac{\pi}{3}, \frac{2\pi}{3}$

c.  $\frac{4\pi}{3}, \frac{5\pi}{3}$

d.  $\frac{\pi}{6}, \frac{5\pi}{6}$

e.  $\frac{7\pi}{6}, \frac{11\pi}{6}$