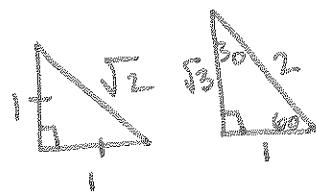


Honors Alg. II
Section 14.4 Worksheet



Name: Key

Find the exact solution to each equation for the interval $0^\circ \leq x < 360^\circ$.

1.) $36\cos x = 18$

$$\begin{aligned} \cos x &= 0.5 \\ x &= \frac{\pi}{3}, \frac{5\pi}{3} \\ x &= 60^\circ, 300^\circ \end{aligned}$$

2.) $18\sin x = 9\sqrt{2}$

$$\begin{aligned} \sin x &= \frac{\sqrt{2}}{2} \\ x &= \frac{\pi}{4}, \frac{3\pi}{4} \\ x &= 45^\circ, 135^\circ \end{aligned}$$

3.) $3\sec x = -6$

$$\begin{aligned} \sec x &= -2 \\ \cos x &= -\frac{1}{2} \\ x &= \frac{2\pi}{3}, \frac{4\pi}{3} \\ x &= 120^\circ, 240^\circ \end{aligned}$$

Find the exact solution to each equation for the interval $0 \leq x < 2\pi$.

4.) $2\sin x - 2 = 0$

$$\begin{aligned} \sin x &= 1 \\ x &= \frac{\pi}{2} \end{aligned}$$

5.) $2 + \sqrt{2} \csc x = 0$

$$\begin{aligned} \sqrt{2} \csc x &= -2 \\ \csc x &= -\frac{2}{\sqrt{2}} \\ \sin x &= \frac{\sqrt{2}}{2} \\ x &= \frac{5\pi}{4}, \frac{7\pi}{4} \end{aligned}$$

7.) $\sqrt{3} + \cot x = 0$

$$\begin{aligned} \cot x &= -\sqrt{3} \\ \tan x &= -\frac{\sqrt{3}}{3} \text{ or } \frac{\sqrt{3}}{3} \end{aligned}$$

$$x = \frac{5\pi}{6}, \frac{11\pi}{6}$$

8.) $15\sin x + 19 = 14\sin x + 18$

$$\begin{aligned} \sin x &= 1 \\ x &= \frac{3\pi}{2} \end{aligned}$$

9.) $2\cos^2 x = 1$

$$\begin{aligned} \cos^2 x &= \frac{1}{2} \\ \cos x &= \pm\frac{1}{\sqrt{2}} = \pm\frac{\sqrt{2}}{2} \end{aligned}$$

$$x = \frac{\pi}{4}, \frac{7\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}$$

10.) $2\cos^2 x + 3\cos x + 1 = 0$

$$(2\cos x + 1)(\cos x + 1) = 0$$

$$\cos x = -\frac{1}{2} \quad \left\{ \begin{array}{l} \cos x = -1 \\ x = \frac{2\pi}{3}, \frac{4\pi}{3} \end{array} \right.$$

$$x = \frac{\pi}{3}, \frac{4\pi}{3} \quad \left\{ \begin{array}{l} x = \pi \end{array} \right.$$

$2x^2 + 3x + 1 = 0$

$$\begin{aligned} x^2 + 3x + 2 &= 0 \\ (x+1)(x+2) &= 0 \\ (2x+1)(x+1) &= 0 \end{aligned}$$

11.) $4\sin^2 x - 8\cos x + 1 = 0$

$$4(1 - \cos^2 x) - 8\cos x + 1 = 0$$

$$4 - 4\cos^2 x - 8\cos x + 1 = 0$$

$$-(4\cos^2 x + 8\cos x - 5) = 0$$

$$-(2\cos x + 5)(2\cos x - 1) = 0$$

$$\cos x = -\frac{5}{2} \quad \left\{ \begin{array}{l} \cos x = \frac{1}{2} \\ x = \frac{\pi}{3}, \frac{5\pi}{3} \end{array} \right.$$

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

$$\sin x(-\sin x + 2) = 0$$

$$\sin x = 0 \quad \left\{ \begin{array}{l} -\sin x = -2 \\ \sin x = 2 \end{array} \right.$$

$$x = 0 \quad \left\{ \begin{array}{l} \\ \end{array} \right.$$