

PC 12 LG 11 Worksheet2 (Trig Equations)

- Solve by graphing, if $0 \leq x < 2\pi$
 - $\sin 2x + \cos 3x = 1.5$
 - $3\sin x = x + 1$
 - $x^2 \sin x = -x$
- Find the exact value of A if $0 \leq A < 2\pi$
 - $2\sin A + 1 = 0$
 - $\sqrt{3} + 2\sin A = 0$
 - $2\tan A = 2$
 - $4\sin A + 2 = 2\sin A + 1$
- Solve to 2 decimal places, if $0 \leq x < 2\pi$
 - $3\sin x + 2 = 0$
 - $5\cos x - 4 = 0$
 - $4\tan x + 1 = 2\tan x + 5$
- Why do the equations of $\sin A = 2$ and $\cos A = -3$ have no solutions and $\tan A = 4$ have solutions?
- Solve exactly using the square root property, if $0 \leq x < 2\pi$
 - $2\cos^2 x - 1 = 0$
 - $4\sin^2 x - 3 = 0$
 - $4\tan^2 x - 4 = 0$
- Solve exactly, if $0 \leq x < 2\pi$. Watch for extraneous roots.
 - $(2\sin x + 1)(\sin x - 1) = 0$
 - $(2\cos x - 1)(\cos x + 2) = 0$
 - $(\tan x - 1)(\cos x + 4) = 0$
- Solve the equation below over each of the given domains. $2\sin^2 x - \sin x - 1 = 0$
 - $0 \leq x < 2\pi$
 - $\pi \leq x < 2\pi$
 - $0 \leq x < \frac{\pi}{2}$
 - $\frac{\pi}{2} \leq x < \frac{3\pi}{2}$
 - $\frac{\pi}{2} \leq x < 2\pi$
 - $-\pi \leq x < 0$
- Solve each of the following equations algebraically for x, $0 \leq x < 2\pi$. Give exact values where possible (otherwise to 2 dec. places). Also, solve over the set of real numbers (give the general solution).
 - $2\sin x \tan x - \tan x = 0$
 - $\tan x - 2\cos x \tan x = 0$

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c. $\cos x \tan x - 3 \tan x = 0$

d. $3 \cos x \tan x - \tan x = 0$

e. $\tan^2 x = \tan x + 2$

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

9. Use identities to solve each of the following equations algebraically for x , $0 \leq x < 2\pi$. Give exact values where possible (otherwise to 2 dec. places). Also, solve over the set of real numbers (give the general solution).

a. $\sin 2x - \sin x = 0$

b. $\cos x + \sin 2x = 0$

c. $\cos x = \cos 2x$

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

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

Answer Key

1. a. 3.84, 4.37 b. 0.54, 1.8
c. 0, 3.44, 6.12

2. a. $\frac{7\pi}{6}, \frac{11\pi}{6}$ b. $\frac{4\pi}{3}, \frac{5\pi}{3}$
c. $\frac{\pi}{4}, \frac{5\pi}{4}$ d. $\frac{7\pi}{6}, \frac{11\pi}{6}$

3. a. 3.87, 5.55 b. 0.64, 5.64
c. 1.11, 4.25

4. SinA and CosA have a range of $-1 \leq A \leq 1$ and the range of TanA is all real numbers.

5. a. $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$ b. $\frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$
c. $\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$

6. a. $\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$ b. $\frac{\pi}{3}, \frac{5\pi}{3}$
c. $\frac{\pi}{4}, \frac{5\pi}{4}$

7. a. $\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$ b. $\frac{7\pi}{6}, \frac{11\pi}{6}$
c. No solution d. $\frac{\pi}{2}, \frac{7\pi}{6}$
e. $\frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{2}$ f. $\frac{-5\pi}{6}, \frac{-\pi}{6}$

8. a. $0, \pi, \frac{\pi}{6}, \frac{5\pi}{6} (+2n\pi, n \in I)$
b. $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3} (+2n\pi, n \in I)$
c. $0, \pi (+2n\pi, n \in I)$
d. $0, \pi, 0.94, 5.34 (+2n\pi, n \in I)$
e. $1.11, 4.25, \frac{3\pi}{4}, \frac{7\pi}{4} (+2n\pi, n \in I)$
f. $\pi, 1.23, 5.05 (+2n\pi, n \in I)$

9. a. $0, \pi, \frac{\pi}{3}, \frac{5\pi}{3} (+2n\pi, n \in I)$
b. $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{7\pi}{6}, \frac{11\pi}{6} (+2n\pi, n \in I)$
c. $0, \frac{2\pi}{3}, \frac{4\pi}{3} (+2n\pi, n \in I)$
d. $\frac{3\pi}{2}, \frac{\pi}{6}, \frac{5\pi}{6} (+2n\pi, n \in I)$
e. $\frac{\pi}{2} (+2n\pi, n \in I)$