Name_____ Date_____ Per_____

**Find all real numbers that satisfy each equation.**

1.  $\sin x = 0$

2.  $\cos x = \dfrac{\sqrt{2}}{2}$

3.  $\tan x = -1$

4.  $\sin x = \dfrac{-\sqrt{2}}{2}$

5.  $2\cos x + \sqrt{3} = 0$

**Find all angles in degrees that satisfy each equation.**

6.  $\cos x = -1$

7.  $\sin x = \dfrac{1}{2}$

8.  $\tan x = \dfrac{1}{\sqrt{3}}$

9.  $2\sin\alpha - \sqrt{3} = 0$

10.  $\tan\alpha - 1 = 0$

**Find all angles in the interval $\left[0°, 360°\right]$ that satisfy each equation. Round approximations to the nearest tenth of a degree.**

11. $\cos\alpha = 0.873$

12.  $\sin\alpha = -0.244$

13.  $\tan\alpha = 5.42$

**Find all real numbers in the interval $[0, 2\pi]$ that satisfy each equation. Round approximations to the nearest hundredth.**

14. $\cos x = -0.23$

15. $\sqrt{6} \tan x + 1 = 0$

16. $7 \sin x - \sqrt{7} = 0$

**Find all real numbers that satisfy each equation.**

17. $\cos\left(\dfrac{x}{2}\right) = \dfrac{1}{2}$

18. $\cos(3x) = 1$

19. $2\sin\left(\dfrac{x}{2}\right) - 1 = 0$

20. $2\sin(2x) = -\sqrt{2}$

21. $\tan(2x) = \sqrt{3}$

22. $\tan(4x) = 0$

**Find all values of $\alpha$ in $[0°, 360°)$ that satisfy each equation.**

23. $2\cos(2\alpha) + 1 = 0$

24. $\sin(6\alpha) = 1$

25. $\tan(3\alpha) - 1 = 0$

**Find all values of $\alpha$ in $[0,2\pi)$ that satisfy each equation.**

26. $2\sin(3\alpha)+\sqrt{3}=0$ 

27. $\sec(2\alpha)=\sqrt{2}$ 

28. $\sqrt{3}\cot\left(\dfrac{a}{3}\right)-3=0$

**Find all values of $\alpha$ in degrees that satisfy each equation. Round approximate answers to the nearest tenth of a degree.**

29. $\sin(3\alpha)=0.34$ 

30. $\cos(2\alpha)=-0.22$

**Solve the problem. Use the following information:**
The total distance $d$ (in feet) traveled by a projectile fired at an angle $\theta$ is related to the initial velocity $v_0$ (in feet per second) by the equation $v_0^2\sin 2\theta = 32d$. The horizontal distance $x$ (in feet) traveled by the object in $t$ seconds is given by the equation $x = v_0 t\cos\theta$.

31. A center fielder fields a ground ball and attempts to make a 230-ft throw to home plate. If he commonly makes long throws at 90 mi/hr, find the two possible angles at which he can throw the ball to home plane. Find the time saved by choosing the smaller angle. (Hint: you will need to convert the velocity to feet per second).