

Math 126 Unit 10 Review

Name Key

#1 - 10: Factor each expression.

1) $4x^3 - 49x$

$x(2x+7)(2x-7)$

2) $9x^2 + 15x + 4$

$(3x+1)(3x+4)$

3) $8x^2 - 6x - 9$

$(2x-3)(4x+3)$

4) $25x^2 - 10x + 1$

$(5x-1)^2$

5) $3x^4 - 243$

$3(x^2+9)(x+3)(x-3)$

6) $12x^3 - 31x^2 + 20x$

$x(3x-4)(4x-5)$

7) $2(x-4)^3 + 6(x-4)^2$

$2(x-4)^2(x-1)$

8) $5(x+1)^4 - 3(x+1)^3$

$(x+1)^3(5x+2)$

9) $x^2(x-4) - 18(x-4)$

$(x-4)(x^2-18)$

10) $x^2(x-6) + 7(x-6)$

$(x-6)(x^2+7)$

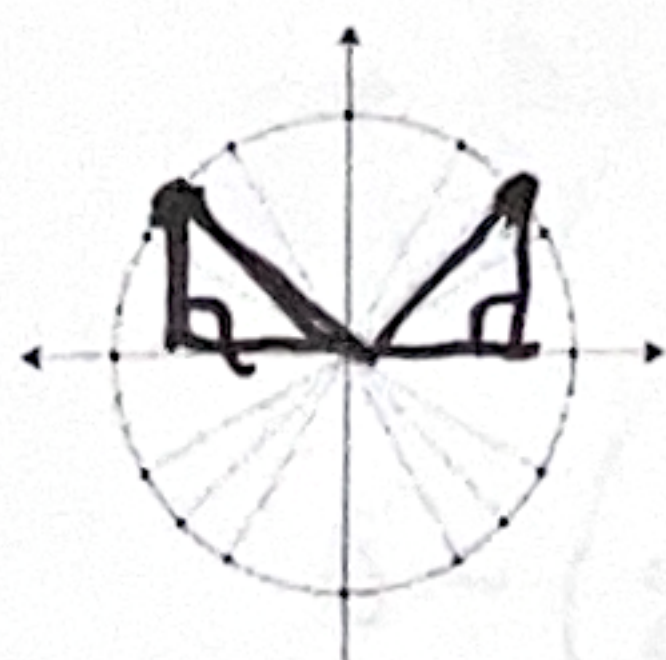
#11 - 18: Use your knowledge of the unit circle to solve for the missing angle, x , in each equation.

Draw a diagram for each, and give all values for the angle, x , when $0 \leq x \leq 2\pi$.

11) $\sin x = \frac{\sqrt{2}}{2}$

y-coord

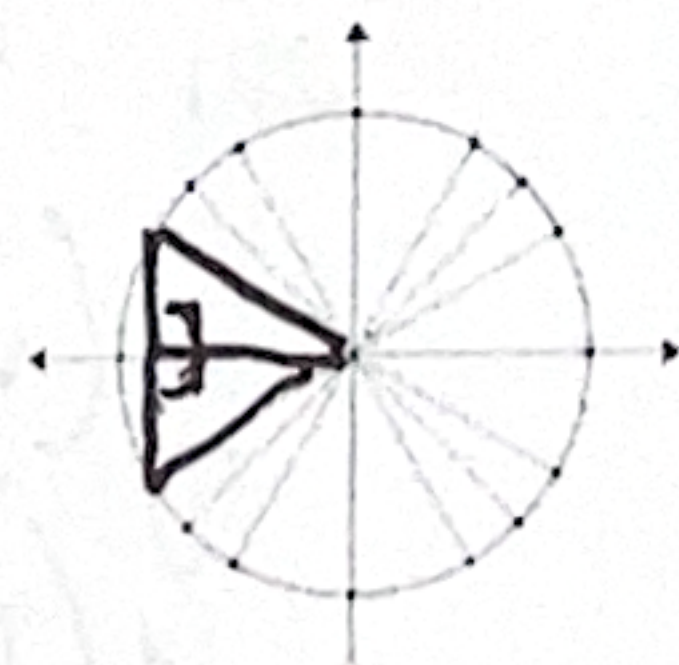
$x = \frac{\pi}{4}, \frac{3\pi}{4}$



12) $\cos x = -\frac{\sqrt{3}}{2}$

x-coord

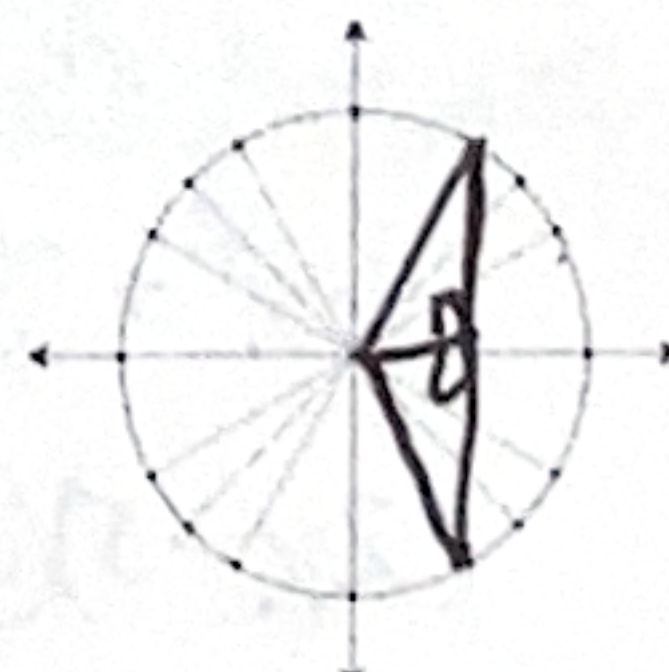
$x = \frac{5\pi}{6}, \frac{7\pi}{6}$



13) $2 \cos x - 1 = 0$

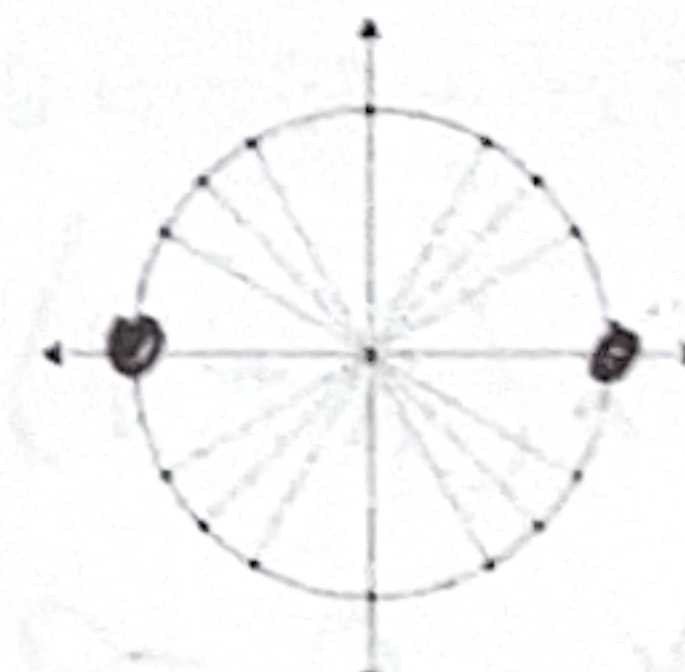
$\cos x = \frac{1}{2}$

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



14) $\tan x = 0$

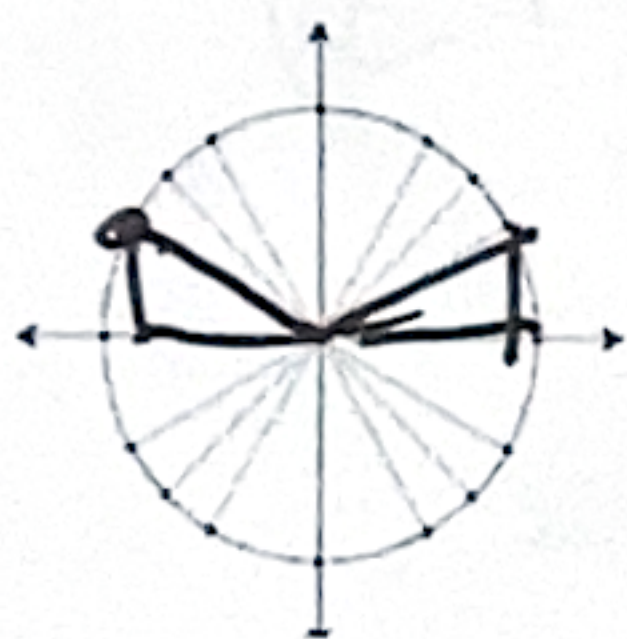
$x = 0 \text{ rad}, \pi, 2\pi$



15) $2 \sin x - 1 = 0$

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

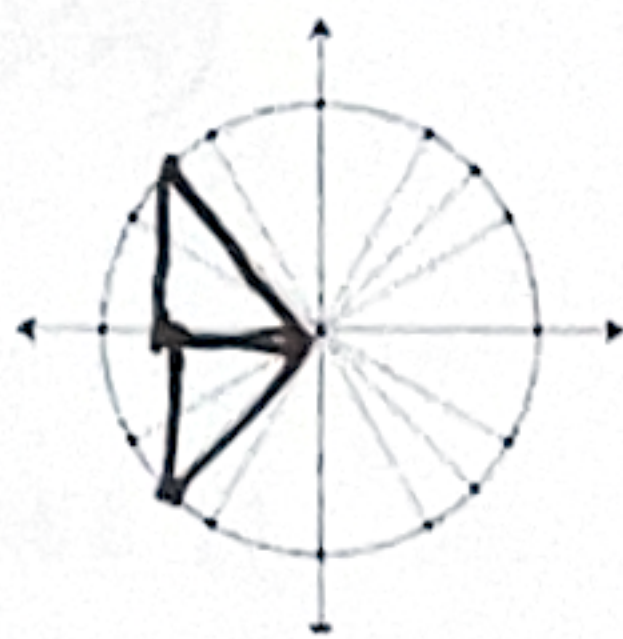
$$x = \frac{\pi}{6}, \frac{5\pi}{6}$$



16) $-2 \cos x = \sqrt{2}$

$$\cos x = -\frac{\sqrt{2}}{2}$$

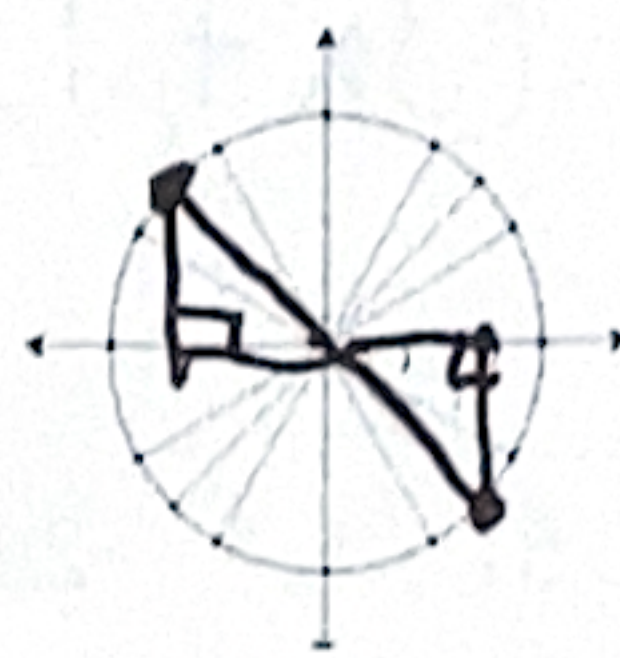
$$x = \frac{3\pi}{4}, \frac{5\pi}{4}$$



17) $-\tan x - 1 = 0$

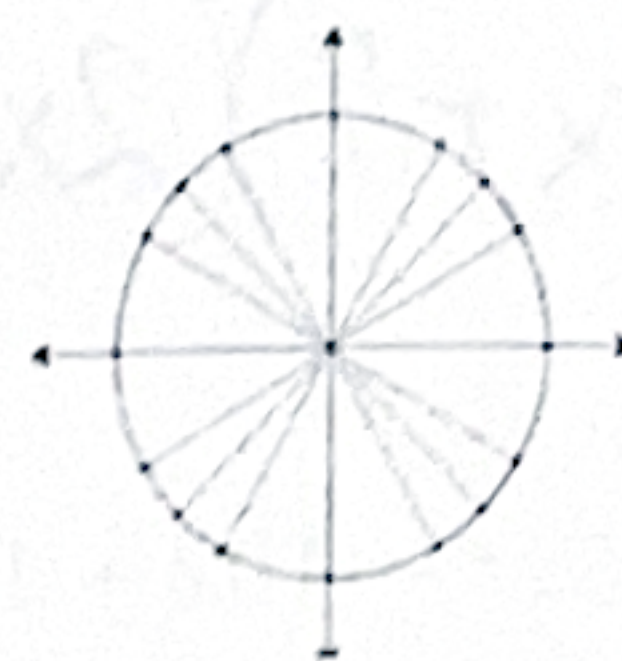
$$\tan x = -1$$

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



18) $-2 \sin x = \sqrt{3}$

$$\sin x = -\frac{\sqrt{3}}{2}$$

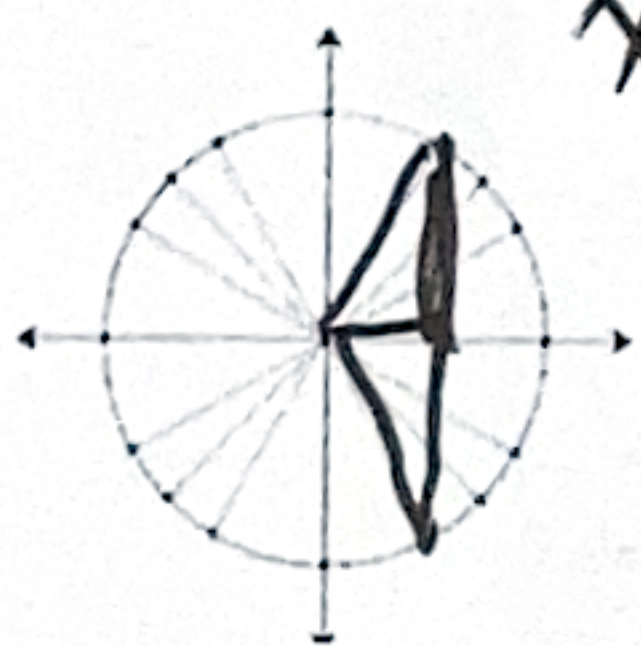


19) $\sec x - 2 = 0$

$$\sec x = 2$$

x -coord, flipped

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

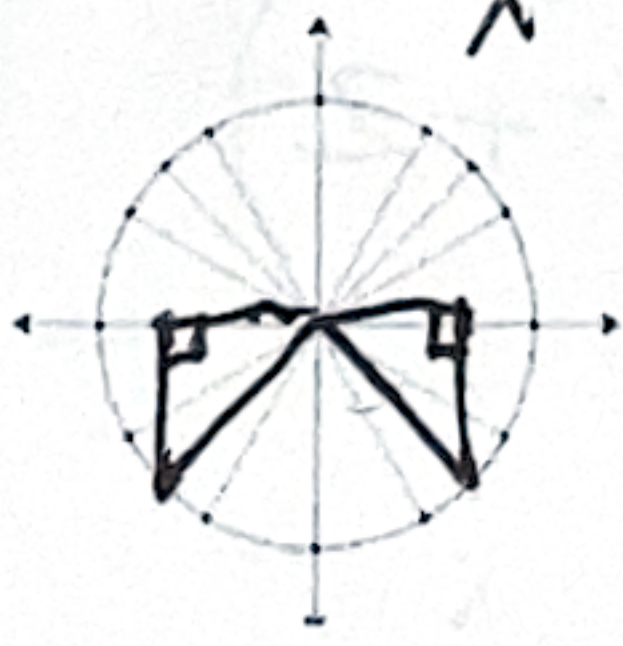


20) $\sqrt{2} \csc x = -2$

$$\csc x = -\frac{2}{\sqrt{2}}$$

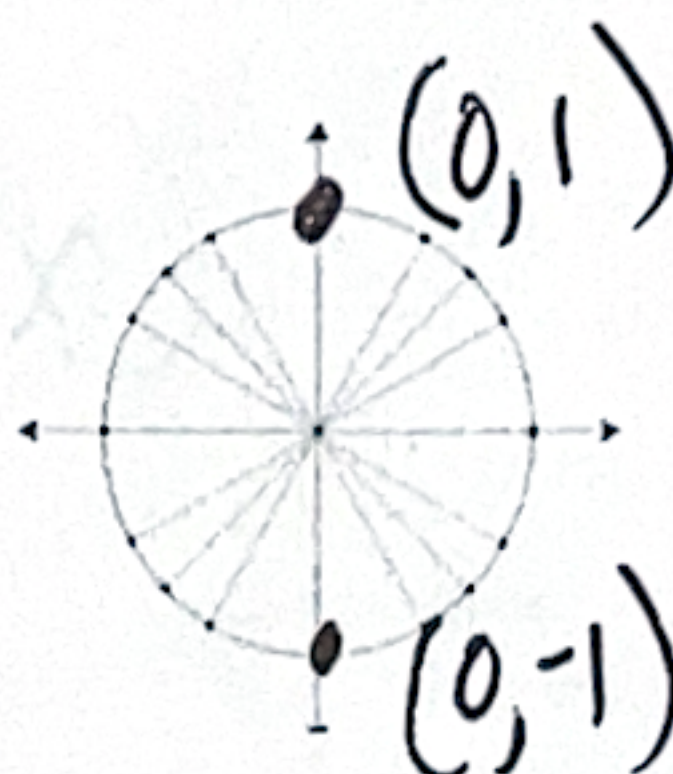
y -coord, flipped

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



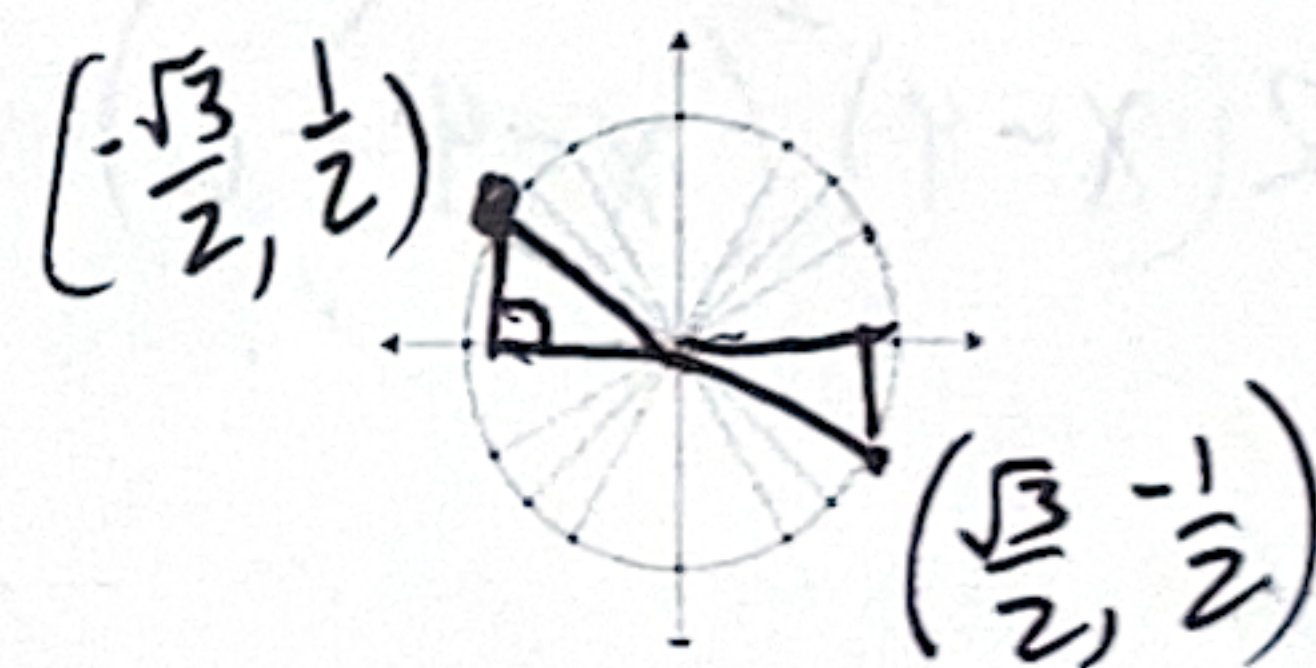
21) $\cot x = \frac{0}{1}$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$



22) $\cot x = -\sqrt{3}$

$$\tan x = -\frac{1}{\sqrt{3}} = -\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$$



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

#23 - 26: Factor each trig expression.

23) $2 \csc^2 x - 3 \csc x + 1$

$$(2 \csc x - 1)(\csc x - 1)$$

24) $2 \sin^2 x + 5 \sin x - 7$

$$(2 \sin x + 7)(\sin x - 1)$$

25) $4 \cos^2 x - 25$

$$(2 \cos x + 5)(2 \cos x - 5)$$

26) $2 \sec^2 x - 12 \sec x$

$$2 \sec x (\sec x - 6)$$

#27 - 33: Factor, then use the zero-product property to solve.

27) $5x^2 + 45x = 0$

$$5x(x + 9) = 0$$

$$x = 0, -9$$

28) $6x^2 - 5 = 13x$

$$6x^2 - 13x - 5 = 0$$

$$(2x - 5)(3x + 1) = 0$$

$$x = \frac{5}{2}, -\frac{1}{3}$$

29) $y^3 - 9y = 0$

$$y(y^2 - 9) = 0$$

$$y(y + 3)(y - 3) = 0$$

$$y = 0, -3, 3$$

$$30) 3(x-1)^2 + (x-1)^3 = 0$$

$$(x-1)^2(x+2) = 0$$

$$x = 1, -2$$

$$31) 2(x+4)^4 + 5(x+4)^3 = 0$$

$$(x+4)^3(2x+13) = 0$$

$$x = -4, -\frac{13}{2}$$

$$32) x^2(x+7) + 16(x+7) = 0$$

$$(x+7)(x^2+16) = 0$$

$$x = -7, \pm 4i$$

$$33) x^2(x-2) - 12(x-2) = 0$$

$$(x-2)(x^2-12) = 0$$

$$x = 2, \pm 2\sqrt{3}$$

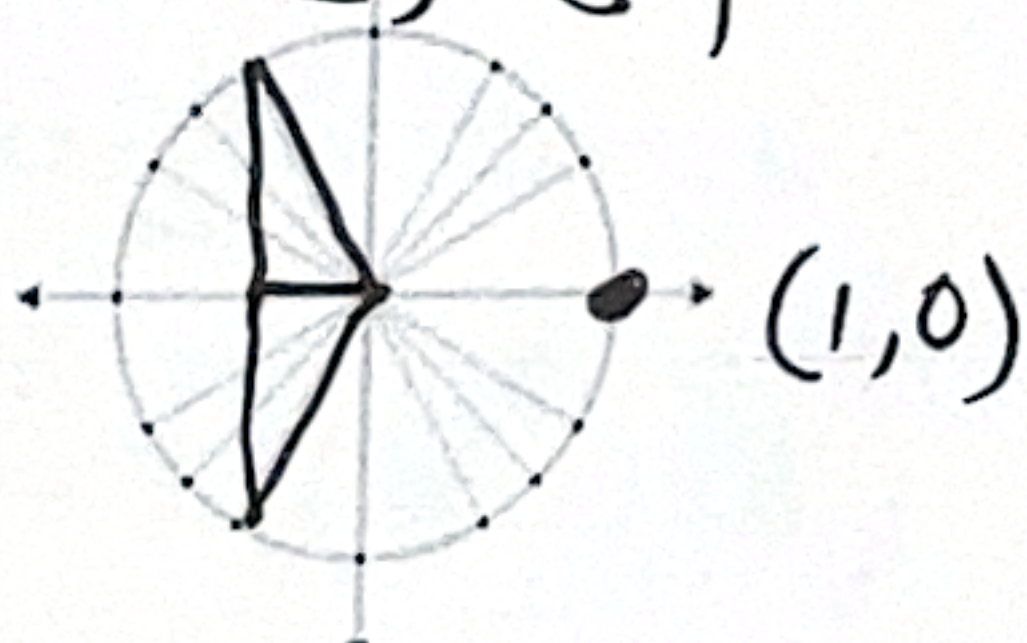
#34 - 41: Solve each trig equation by factoring.

$$34) 2\cos^2 x - \cos x - 1 = 0$$

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

$$\cos x = -\frac{1}{2} \quad \cos x = 1$$

$$x = \frac{2\pi}{3}, \frac{4\pi}{3}, 2\pi, 0 \text{ rad}$$

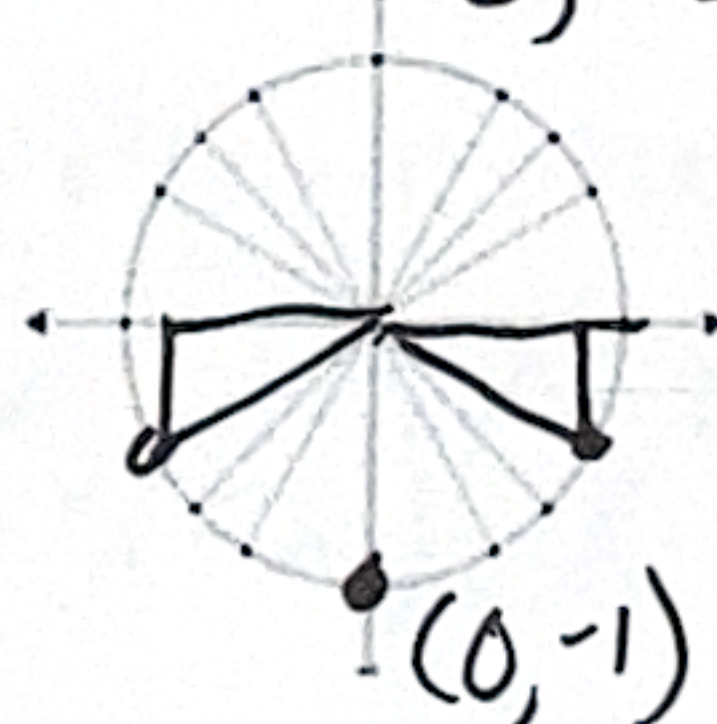


$$35) 2\sin^2 x + 3\sin x + 1 = 0$$

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

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

$$x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{3\pi}{2}$$

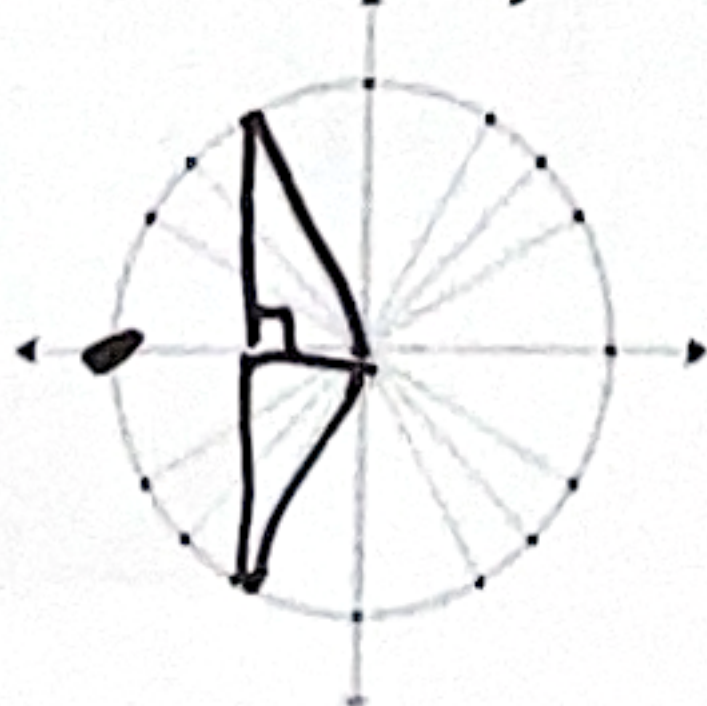


$$36) \csc^2 x + 3\csc x + 2 = 0$$

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

$$\csc x = -1 \quad \csc x = -2$$

$$x = \pi, \frac{2\pi}{3}, \frac{4\pi}{3}$$



$$37) \tan^2 x + \tan x = 0$$

$$\tan x(\tan x + 1) = 0$$

$$\tan x = 0 \quad \tan x = -1$$

$$x = 0, \pi, 2\pi, \frac{3\pi}{4}, \frac{7\pi}{4}$$

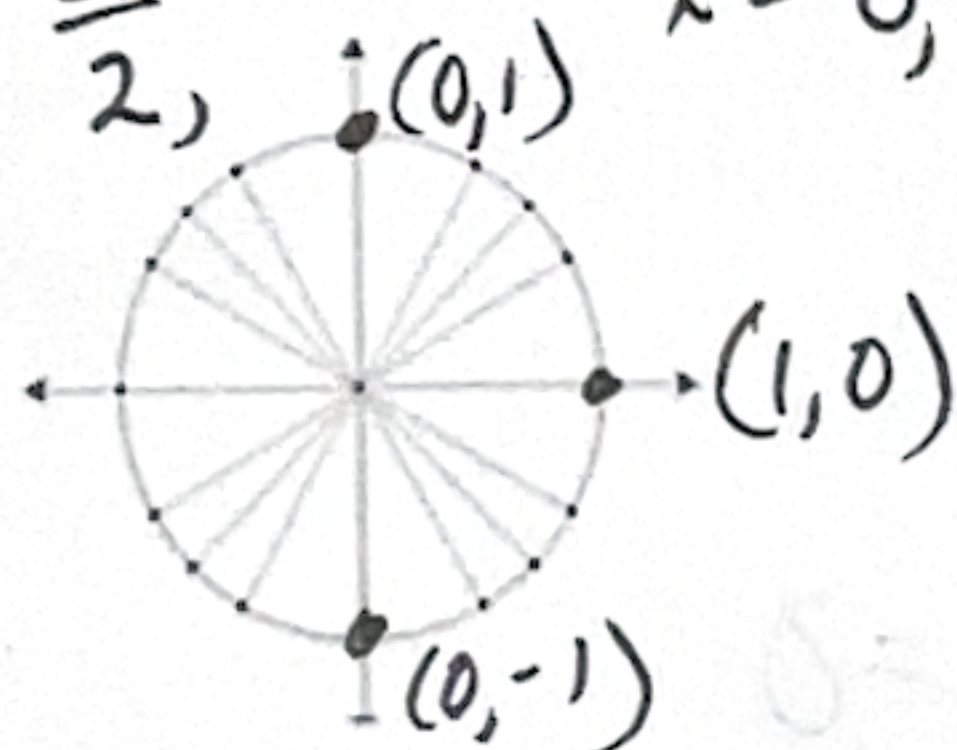


$$38) \cos^2 x - \cos x = 0$$

$$\cos x (\cos x - 1) = 0$$

$$\cos x = 0 \quad \cos x = 1$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}, \quad x = 0, 2\pi$$

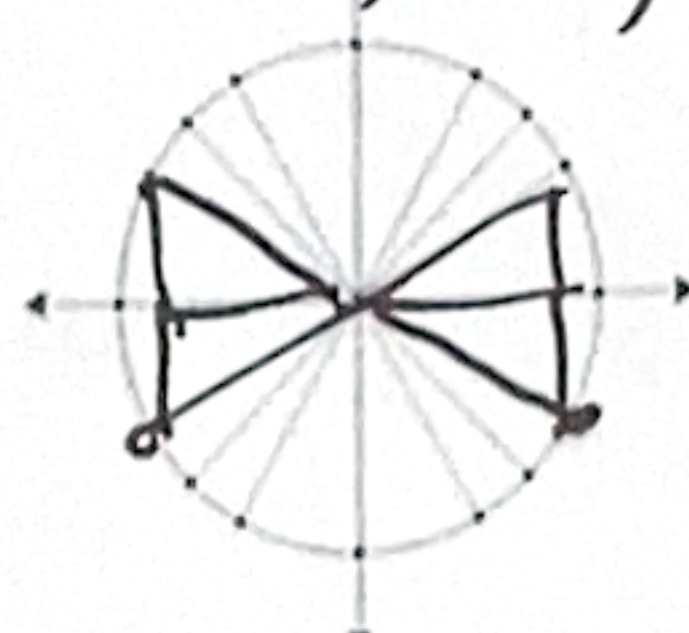


$$39) 4\sin^2 x - 1 = 0$$

$$(2\sin x + 1)(2\sin x - 1) = 0$$

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

$$x = \frac{7\pi}{6}, \frac{11\pi}{6}, \frac{\pi}{6}, \frac{5\pi}{6}$$

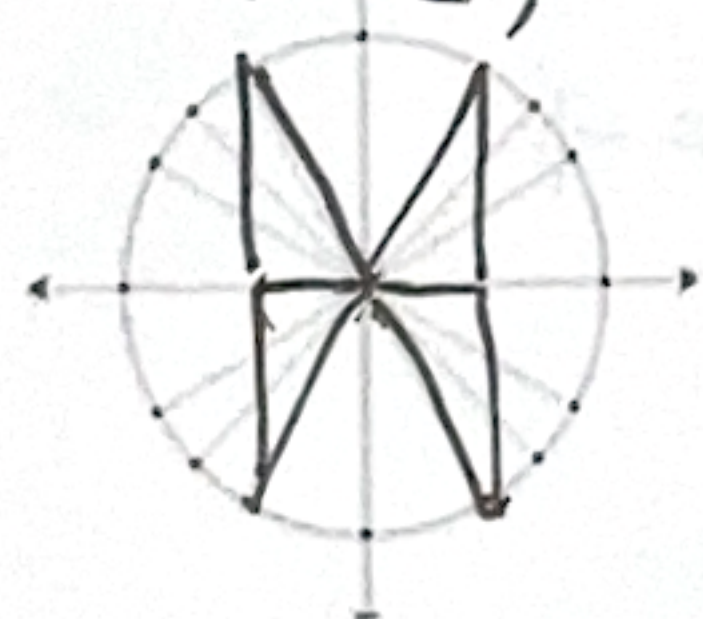


$$40) \sec^2 x - 4 = 0$$

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

$$\sec x = -2 \quad \sec x = 2$$

$$x = \frac{2\pi}{3}, \frac{4\pi}{3}, \quad x = \frac{\pi}{3}, \frac{5\pi}{3}$$



$$41) 2\cos^2 x - 3\cos x + 1 = 0$$

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

$$\cos x = \frac{1}{2} \quad \cos x = 1$$

$$x = \frac{\pi}{3}, \frac{5\pi}{3}, \quad 0, 2\pi$$

