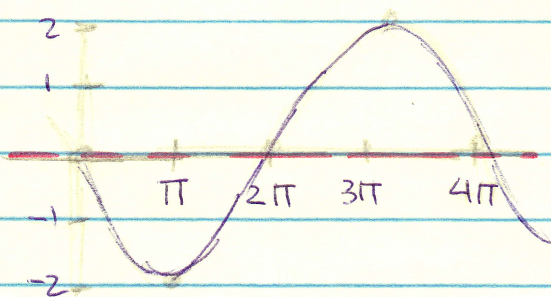


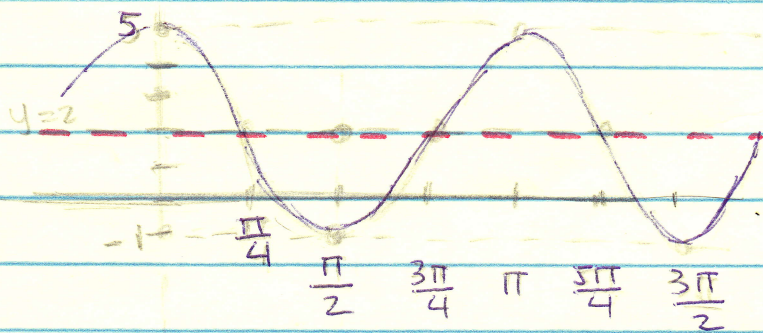
① $\tan 40^\circ \approx .84$
 $y - 2 = .84(x - 3)$
 $y - 2 = .84x - 2.52$
 $y = .84x - .52$

② $8x + 3y = 10$
 $3y = -8x + 10$
 $y = -\frac{8}{3}x + \frac{10}{3}$
 $m = -69.4 + 180^\circ$
 $\approx 110.6^\circ$

3 $A = 2$
 $B = \frac{1}{2}$
 $\text{Per} = \frac{2\pi}{B} = \frac{2\pi}{\frac{1}{2}} = 4\pi$
 $\text{Scale} = \frac{4\pi}{4} = \pi$
 $\text{Phase shift} \rightarrow \text{none}$
 Reflected x axis



4 $A = 3$
 $\text{AOW: } y = 2$
 $B = 2$
 $\text{Per} = \frac{2\pi}{2} = \pi$
 $\text{Scale: } \pi/4$
 $\text{Phase shift } \text{Rt } \pi/2$
 Reflected x axis

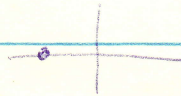


5 $\text{AOW } y = 0$
 $A = 2$
 $\text{Per} = 4 = \frac{2\pi}{B} \rightarrow 4B = 2\pi \rightarrow B = \frac{\pi}{2}$

5 $y = 2 \sin \frac{\pi}{2}(x+1)$ or $y = 2 \sin \frac{\pi}{2}(x-3)$

6 $y = 2 \cos \frac{\pi}{2}(x)$

$$12. \frac{\cos^2 x}{1 - \sin x} \cdot \frac{1 + \sin x}{1 + \sin x} = \frac{\cos^2 x (1 + \sin x)}{1 - \sin^2 x} = \frac{\cos^2 x (1 + \sin x)}{\cos^2 x} = 1 + \sin x$$

$$13. \begin{aligned} 1 + \cos 4x &= 0 \\ \cos 4x &= -1 \rightarrow (-1, 0) \end{aligned}$$


$$4x = \pi + 2n\pi$$

$$x = \frac{\pi}{4} + \frac{2n\pi}{4}$$

$$\frac{\pi}{4}; \quad \frac{\pi}{4} + \frac{2\pi}{4} = \frac{3\pi}{4}; \quad \frac{3\pi}{4} + \frac{2\pi}{4} = \frac{5\pi}{4}; \quad \frac{5\pi}{4} + \frac{2\pi}{4} = \frac{7\pi}{4}$$

$$14. \begin{aligned} \sin x (-1 + \sin x) &= \cos^2 x \\ -\sin x + \sin^2 x &= \cos^2 x \\ -\sin x + \sin^2 x &= 1 - \sin^2 x \\ 2\sin^2 x - \sin x - 1 &= 0 \\ (2\sin x + 1)(\sin x - 1) &= 0 \end{aligned}$$

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

$$\sin x = 1 \rightarrow (0, 1)$$

$$Q \text{ III: } \frac{7\pi}{6}$$

$$Q \text{ IV: } \frac{11\pi}{6}$$

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



$$15 \quad 2 \tan x \csc x + 3 \tan x = 0$$

$$\tan x (2 \csc x + 3) = 0$$

$$\tan x = 0 \rightarrow 0; \pi$$

$$2 \csc x + 3 = 0 \rightarrow \csc x = -\frac{3}{2}$$

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

$$\text{Ref } \angle \approx .73$$

$$\text{Q III} \quad \pi + .73 \approx 3.87$$

$$\text{Q IV} \quad 2\pi - .73 \approx 5.55$$

$$16. \quad 2 \csc \frac{x}{3} = 5 \rightarrow \csc \frac{x}{3} = \frac{5}{2} \rightarrow \sin \frac{x}{3} = \frac{2}{5} \quad \text{Ref } \angle = \sin^{-1}\left(\frac{2}{5}\right)$$

$$\text{Q I: } \frac{x}{3} = 23.6 + 360n \quad \text{Q II: } \frac{x}{3} = 156.4 + 360n$$

$$x = 70.8 + 1080n$$

$$x = 469.2 + 1080n$$

70.8

$$17 \quad (2 \sin x + 1)(3 \cos x - 1) = 0$$

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

$$3 \cos x - 1 = 0$$

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

$$\cos x = \frac{1}{3} \quad \text{Q I; IV}$$

$$\text{Q I; II} \quad 30^\circ; 150^\circ$$

$$\approx 70.5^\circ; 360 - 70.5^\circ \approx 289.5^\circ$$

$$18 \quad 10 \cos^2 x - 5 \sin^2 x - \cos x - 1 = 0$$

$$10 \cos^2 x - 5(1 - \cos^2 x) - \cos x - 1 = 0$$

$$10 \cos^2 x - 5 + 5 \cos^2 x - \cos x - 1 = 0$$

$$15 \cos^2 x - \cos x - 6 = 0$$

$$3 \cos x \quad -2$$

$$5 \cos x \quad +3$$

$$(3 \cos x - 2)(5 \cos x + 3) = 0$$

$$\cos x = \frac{2}{3}$$

$$\cos x = -\frac{3}{5} \quad \text{Ref } \angle = 53.1^\circ \text{ Q II, III}$$

Q I; IV

$$48.2^\circ; 360^\circ - 48.2^\circ$$

$$126.9^\circ$$

$$180 + 53.1^\circ$$

$$311.8^\circ$$

$$233.1^\circ$$

19 $4 \sin x + 9 \cos x = 0$

$$4 \sin x = -9 \cos x$$

$$\sin x = -\frac{9 \cos x}{4}$$

$$\tan x = \frac{\sin x}{\cos x} = \frac{-9 \cos x}{4} \cdot \frac{1}{\cos x} = -\frac{9}{4}$$

$\tan x$ is neg in QII and QIV

$$\text{ref } \angle = \tan^{-1}\left(\frac{9}{4}\right) \approx 66.0^\circ$$

QII $180^\circ - 66.0^\circ \approx 114^\circ$

QIV $360^\circ - 66.0^\circ \approx 294^\circ$

20 $3 \cos 3x - 1 = 0$

$$\cos 3x = \frac{1}{3}$$

QIV

$$\text{ref } \angle: \cos^{-1}\left(\frac{1}{3}\right) \approx 70.5^\circ$$

| | | | |
|-----|---------------------------------------|---|---|
| Q I | $3x \approx 70.5^\circ + n \cdot 360$ | } | $3x \approx 360 - 70.5^\circ \approx 289.5^\circ + n \cdot 360$ |
| | $x \approx 23.5^\circ + n \cdot 120$ | | $x \approx 96.5^\circ + n \cdot 120$ |
| | $23.5 + 120 \approx 143.5^\circ$ | | $96.5 + 120 \approx 216.5^\circ$ |
| | $143.5 + 120 \approx 263.5^\circ$ | | $216.5 + 120 \approx 336.5^\circ$ |

21 $\sin x \cos x = \sin x$

$$\sin x \cos x - \sin x = 0$$

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

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

(1,0) (-1,0) (1,0)

0, π 0

0, π

22 $\tan^3 x = 3 \tan x$

$$\tan^3 x - 3 \tan x = 0$$

$$\tan x (\tan^2 x - 3) = 0$$

$$\tan x = 0 \rightarrow 0, \pi$$

$$\tan^2 x - 3 = 0$$

$$\tan^2 x = 3$$

$$\tan x = \pm \sqrt{3}$$

$\frac{\pi}{3}$ $\frac{2\pi}{3}$ $\frac{4\pi}{3}$ $\frac{5\pi}{3}$

$$(23) \sin^2 x - \sin x = 0$$

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

$$\sin x = 0$$

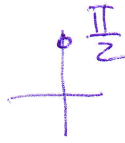
$$(1, 0)$$

$$(-1, 0)$$

$$\sin x - 1 = 0$$

$$\sin x = 1$$

$$(0, 1)$$



$$0, \frac{\pi}{2}, \pi$$

$$(24) 2 \sin 2x + 1 = 0$$

$$2 \sin 2x = -1$$

$$\sin 2x = -\frac{1}{2} \rightarrow \text{Q III \& IV}$$

$$2x = \frac{7\pi}{6} + 2n\pi$$

$$2x = \frac{11\pi}{6} + 2n\pi$$

$$x = \frac{7\pi}{12} + n\pi$$

$$x = \frac{11\pi}{12} + n\pi$$

$$\frac{7\pi}{12}, \frac{19\pi}{12}$$

$$\frac{11\pi}{12}, \frac{23\pi}{12}$$

$$\frac{7\pi}{12}, \frac{11\pi}{12}, \frac{19\pi}{12}, \frac{23\pi}{12}$$