25. $y = 3\sin\left(2x + \pi\right) - 2$

D: $-\infty, \infty$
R: $[-5, 1]$

26. $y = 2\sin\left(x - \frac{\pi}{4}\right) + 2$

D: $(-\infty, \infty)$
R: $[-2 + (2),\ 2 + (2)]$
$[0, 4]$

27. $y = -2\cos\left(\frac{1}{2}x + \frac{\pi}{2}\right) - 1$

D: $(-\infty, \infty)$
R: $[-2 + (-1),\ 2 + (-1)]$
R: $[-3, 1]$

28. $y = -3\cos\left(\frac{1}{3}x - \pi\right) + 1$

D: $(-\infty, \infty)$

R: $[-3 + (1),\ 3 + (1)]$
R: $[-2, 4]$

$y = \sin(x)$
D: $(-\infty, \infty)$
R: $[-1, 1]$

$y = e.f(x)$
$y = 3\sin(x)$
R: $[-3, 3]$
$y = 3\sin(x) - 2$
R: $[-3 + (-2),\ 3 + (-2)]$
$[-5, 1]$

$y = 2\sin$
R: $[-2, 2]$

$y = \cos x$
D: $(-\infty, \infty)$
R: $[-1, 1]$

$y = -2\cos x$

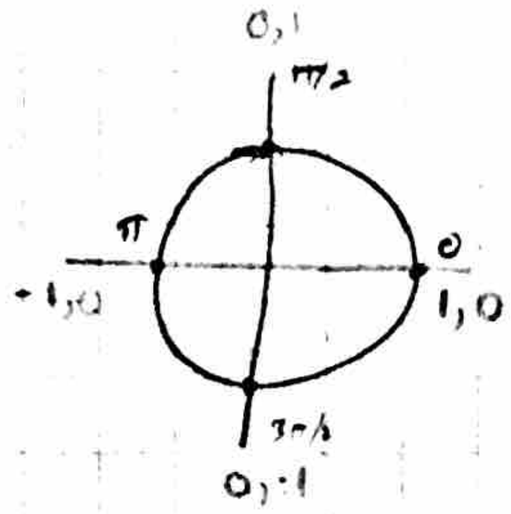
R: $[-2, 2]$

$y = \cos(x)$
R: $[-1, 1]$

$y = -3\cos x$
R: $[-3, 3]$

$y = -3\cos(x) + 1$
R: $[-3 + (1),\ 3 + (1)]$
R: $[-2, 4]$

30. $y = 2\tan\left(\frac{1}{3}x - \frac{\pi}{6}\right) - 3$



$y = \tan(x)$

$y = \frac{y}{x}$ ↙

$x > 0$

$x > \pi/2$

$\frac{\pi}{2} + \pi k$

$\frac{1}{3}x - \frac{\pi}{6} = \frac{\pi}{2} + \pi k$

$+\frac{\pi}{6} \quad +\frac{\pi}{6}$

$\frac{1}{3}x = \frac{2\pi}{3} + \pi k$

$\frac{\pi}{2} \cdot \frac{6}{6} = \frac{6\pi}{12}$

$+\frac{\pi}{6} \cdot \frac{2}{2} = +\frac{2\pi}{12}$

$\frac{8\pi}{12} = \frac{2\pi}{3}$

↓

$\left(\frac{3}{1}\right)\frac{1}{3}x = 3\left(\frac{2\pi}{3} + \pi k\right)$

↓

$x = 2\pi + 3\pi k$

31. $y = 3\cot\left(\frac{1}{4}x + \frac{\pi}{2}\right) + 2$

↓

$\frac{1}{4}x + \frac{\pi}{2} = 0 + \pi k$

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

$\frac{1}{4}x = -\frac{\pi}{2} + \pi k$

↓

$(4)\cdot\frac{1}{4}x = 4\left(-\frac{\pi}{2} + \pi k\right)$

Domain: $x \neq -2\pi + 4\pi k$

R: $(-\infty, \infty)$

$y = \cot x = \frac{x}{y}$

$y > 0$

$0 + \pi k$

$y(y) = \left(\frac{x}{y}\right)y$

↓

$y^2 = x$

Find Domain and Range For Cosecant

33. $y = 4\csc(2x+\pi) - 3$

② Solve for x

$$2x + \pi = 0 + \pi k$$
$$-\pi \quad -\pi$$
$$2x = -\pi + \pi k$$
$$\pi(-1+k)$$

Proof

$\pi(-k)$ or $\pi(k)$

$-\pi k$ $\quad$ πk

↑ k represents all real numbers

$-\pi + \pi k = \pi k$

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

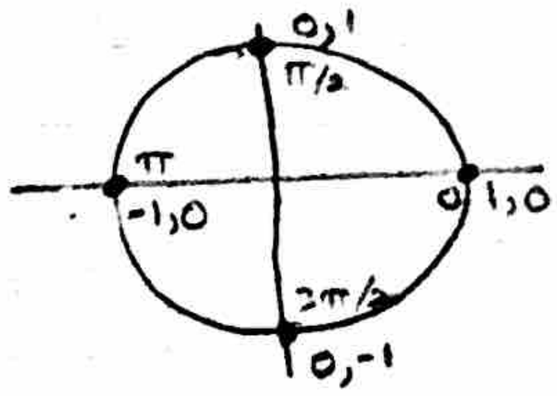
Domain is $x = \frac{\pi}{2} k$

x cannot equal to $\frac{\pi}{2} k$

① Get $y = \csc(x)$ Domain

$$y = \frac{1}{\sin(x)} = \frac{1}{y}$$

$y > 0$



y equals to 0 at 0 and π.

$0 + \pi k$

I'm going to use this

③ Get Range

$y = \csc(x)$ Range: $(-\infty, -1] \cup [1, \infty)$

$y = 4\csc(x)$ Range: $(-\infty, -4] \cup [4, \infty)$

$c \cdot f(x)$

Stretch up and down 4 units

$y = 4\csc(x) - 3$ Range: $(-\infty, -4+(-3)] \cup [4+(-3), \infty)$

Range: $(-\infty, -7] \cup [1, \infty)$

$$y = 2\sec\left(\frac{1}{3}x - 3\pi\right) + 2$$

$$\frac{1}{3}x - 3\pi = \frac{\pi}{2} + \pi k$$

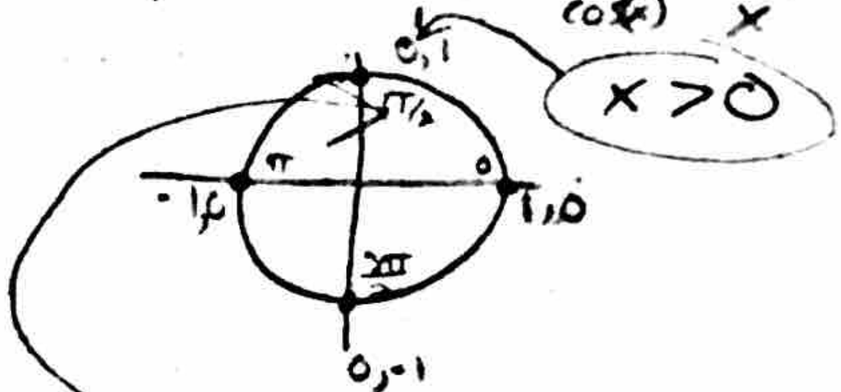
$$+3\pi \quad +3\pi$$

$$\frac{1}{3}x = \frac{7\pi}{2} + \pi k$$

$$(3)\frac{1}{3}x = 3\left(\frac{7\pi}{2} + \pi k\right)$$

Domain: $\boxed{x = \frac{21\pi}{2} + 3\pi k}$

$y = \sec(x) = \frac{1}{\cos(x)} = \frac{1}{x}$



Range: $y = \sec x \quad (-\infty, -1]$

$\cup$

$[1, \infty)$

$y = 2\sec x \quad (-\infty, -2]$

$\cup$

$[2, \infty)$

$y = 2\sec(x) + 2$

$(-\infty, -2 + (2)]$

$\cup$

$[2 + (2), \infty)$

$\rightarrow \quad (-\infty, 0]$

$\cup$

$[4, \infty)$