Translations

$y = \sin(x + c) + d$

$y = \cos(x - c) + d$

- c is called the phase shift, the left & right movement (opposites)
- d is called the midline shift, the up & down movement

examples

1. $y = \sin(x - \pi/4) + 1$

L ~~R~~ $\pi/4$

U 1

2. $y = \cos(x + 30) - 3$

~~L~~ R 30°

D 3

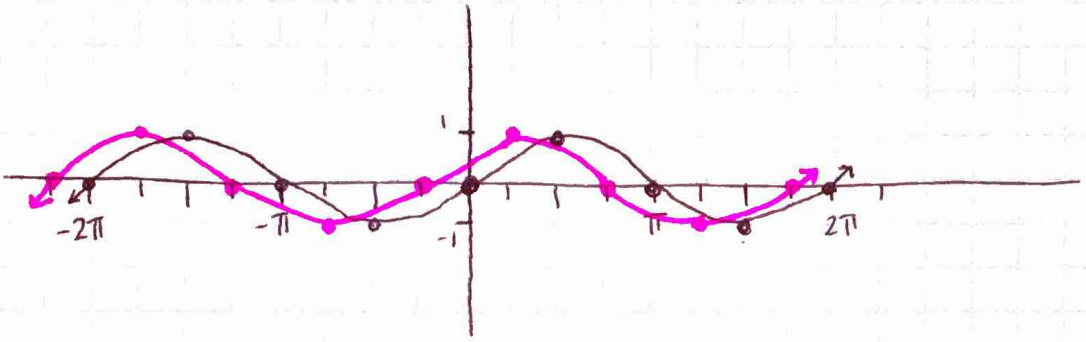
* make sure the axes are set up correctly *

$y = \sin(x + \pi/4)$

PF: $y = \sin x$

L $\pi/4$

$0 \to U \to 0 \to D \to 0$

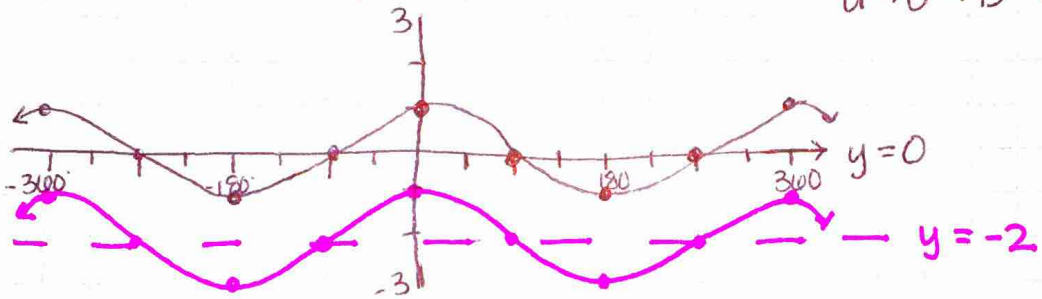


$y = \cos x - 2$ (D)

PF: $y = \cos x$

D2

$U \to 0 \to D \to 0 \to U$



$y = \sin(x + 30) - 1$

PF: $y = \sin x$ D

L30, D1

① down 1