Mar. 17, 2014

Sects. 3-2 ; 3 ! 6

Graphing Trig Functions

Amplitude Change

Vertical Shifts

Period Changes

Phase Shifts (Horiz. Shift)

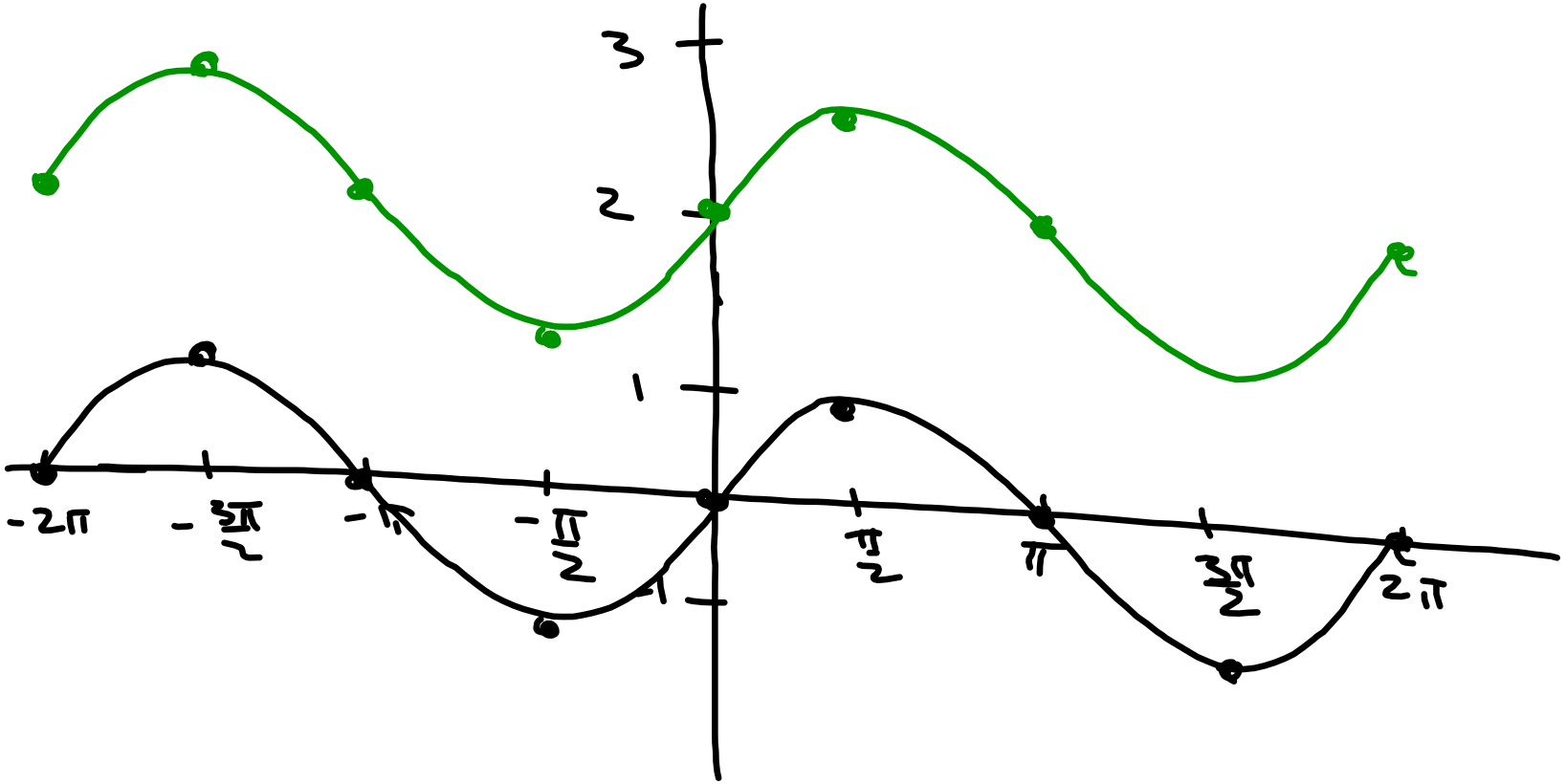
Together

Vertical Shift

$y = \sin\theta$

θ	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
y	0	1	0	-1	0

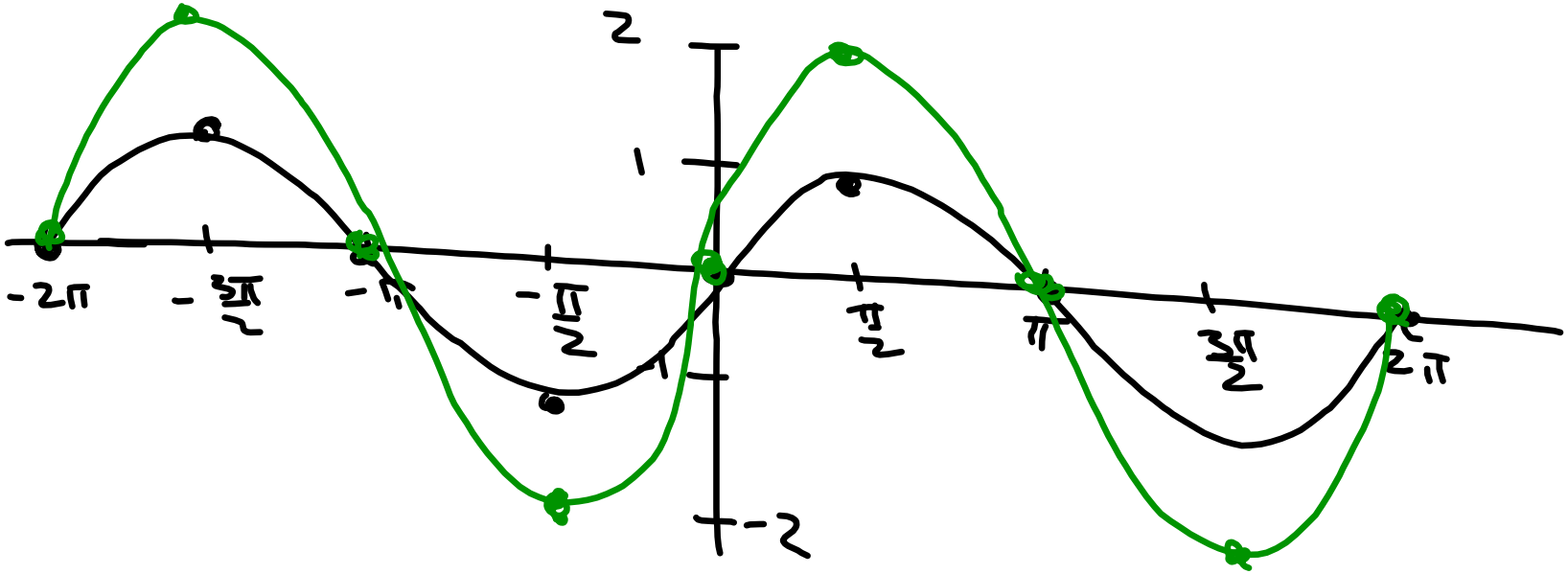
$y = \sin\theta + 2$



Amplitude Change

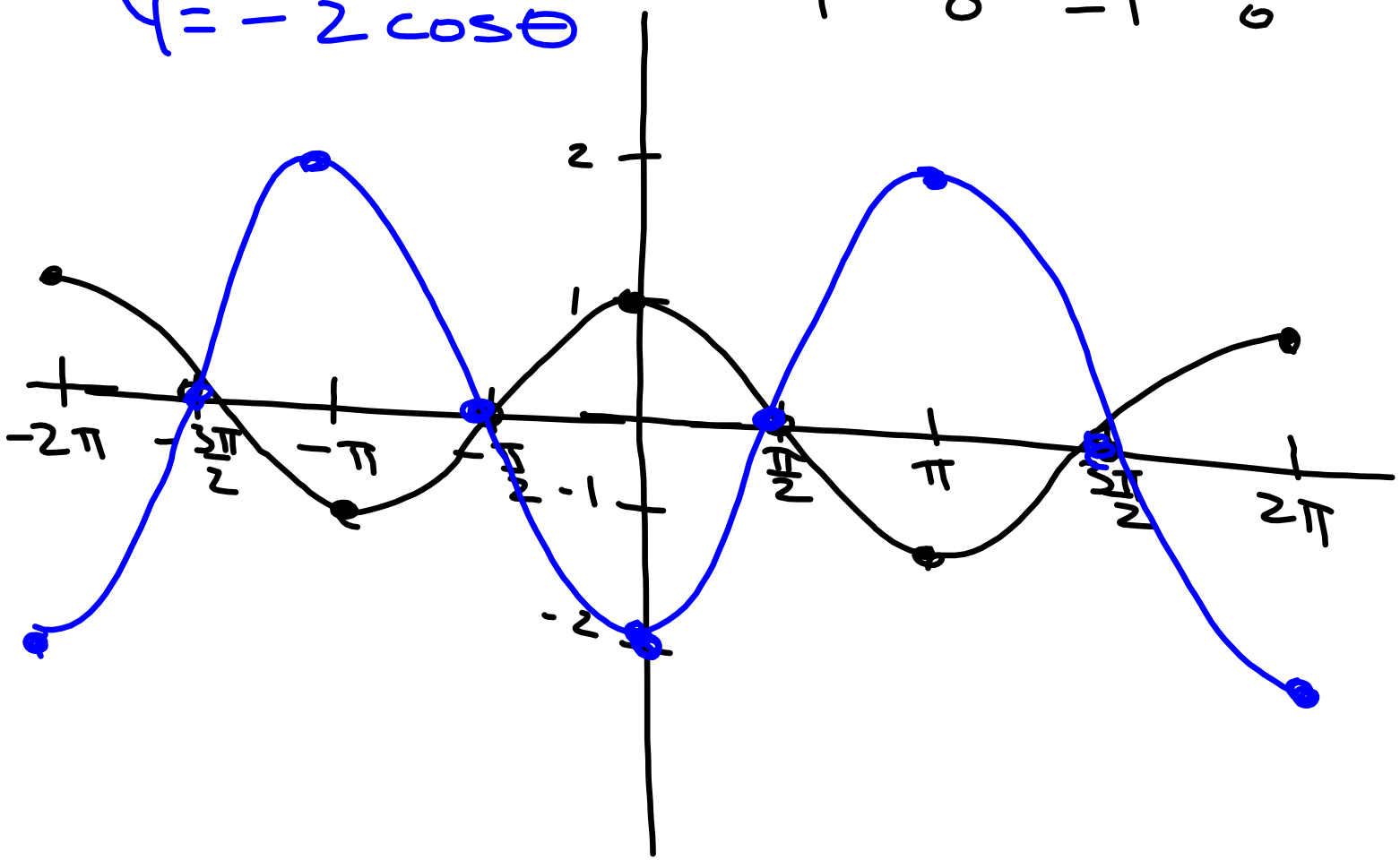
$y = \sin\theta$

$y = 2\sin\theta$



$y = \cos\theta$ $\quad 0 \quad \frac{\pi}{2} \quad \pi \quad \frac{3\pi}{2} \quad 2\pi$

$y = -2\cos\theta$ $\quad 1 \quad 0 \quad -1 \quad 0 \quad 1$



Period Change

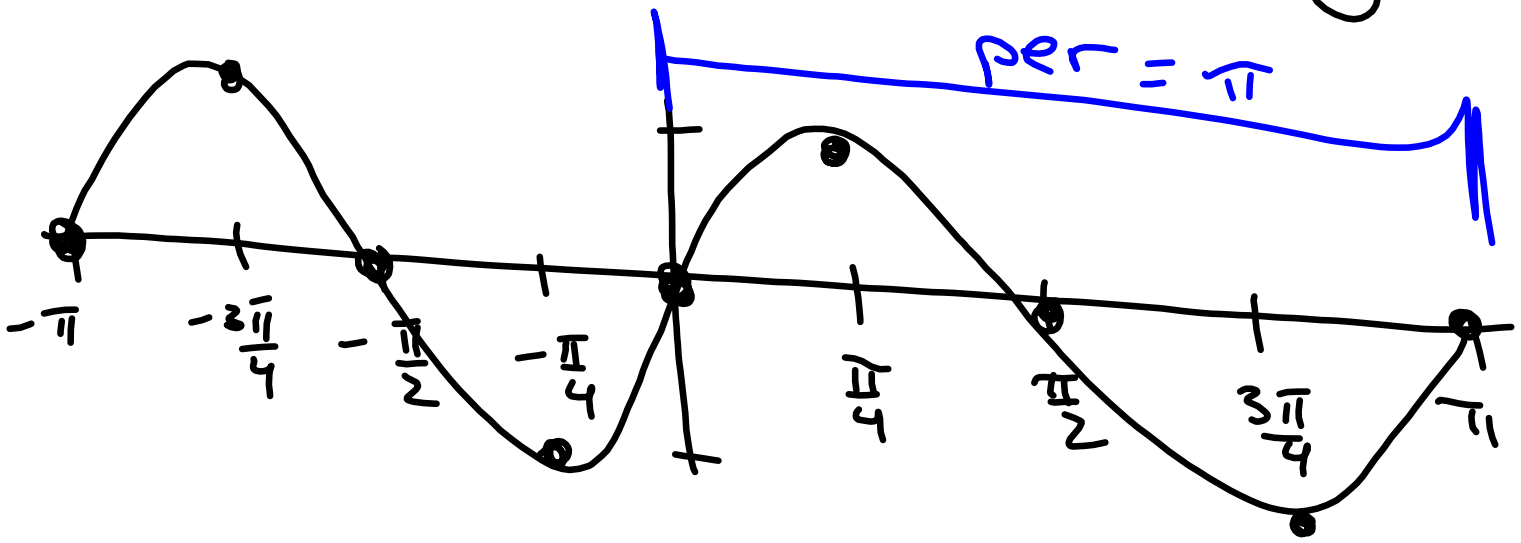
per.

$2\theta = 2\pi$

$\theta = \pi$

$y = \sin 2\theta$

2θ	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
θ	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
$\sin\theta$	0	1	0	-1	0



To find the period

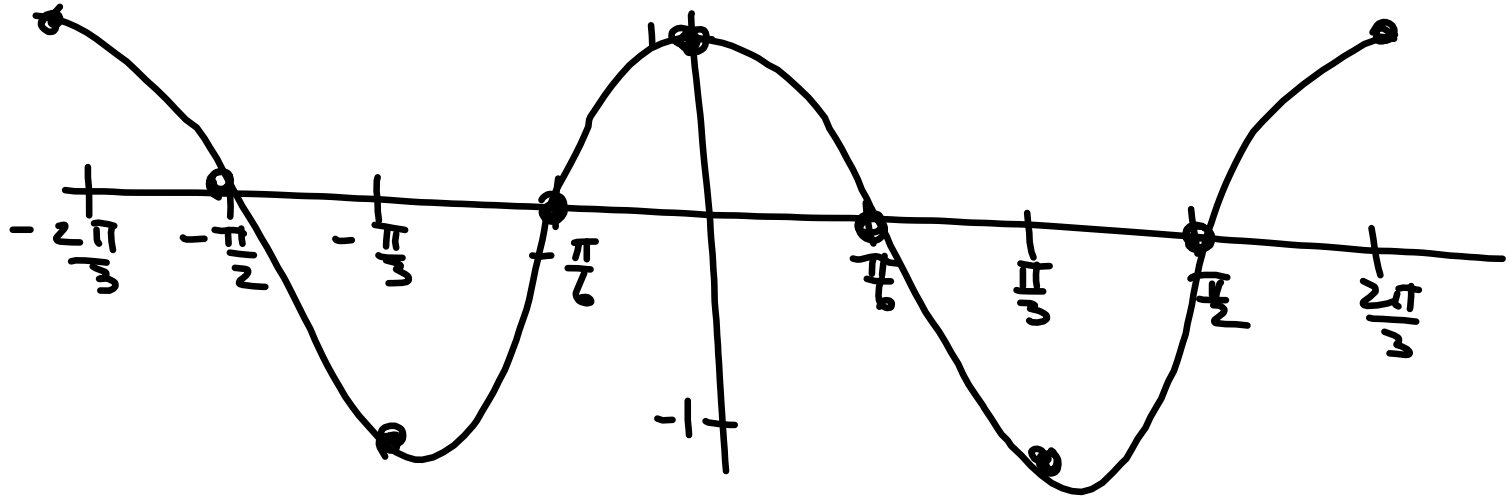
$y = \sin B\theta$

$B\theta = 2\pi$ (normal period)

$\theta = \frac{2\pi}{B}$

$y = \cos 3\theta$ per: $\frac{2\pi}{3}$

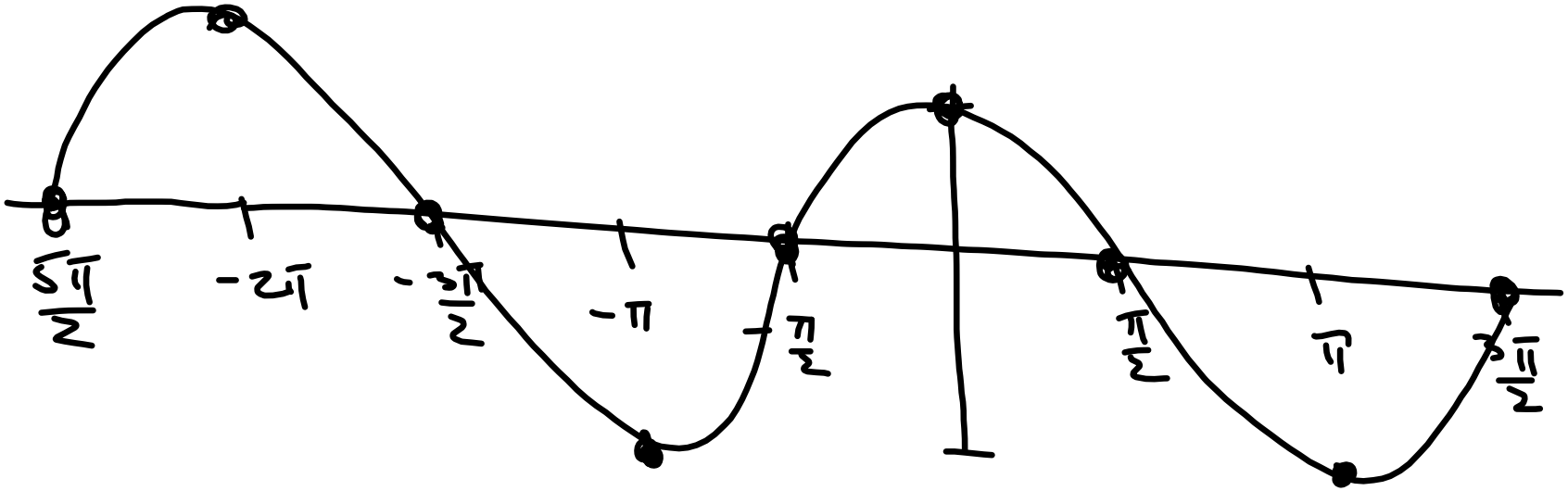
3θ	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
θ	0	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$
$\cos\theta$	1	0	-1	0	1

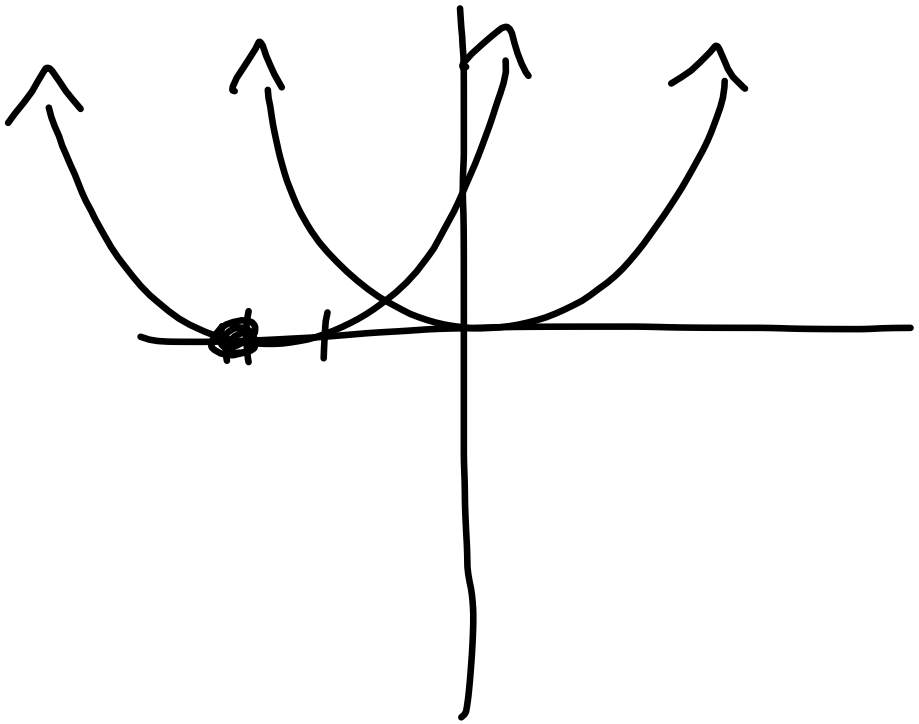


Phase Shift
(Horiz Shift)

$$y = \sin\left(\theta + \frac{\pi}{2}\right)$$

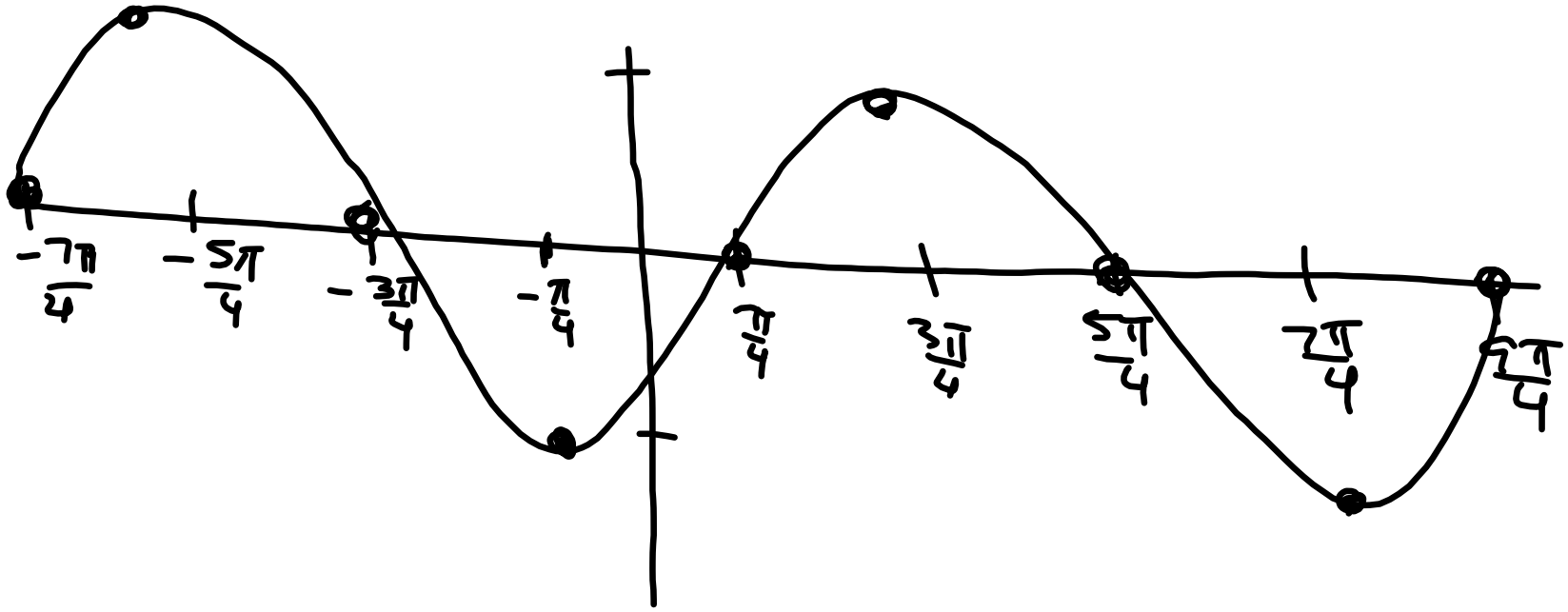
$\theta + \frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
θ	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$
$\sin\theta$	0	1	0	-1	0




x^2
$(x+2)^2$

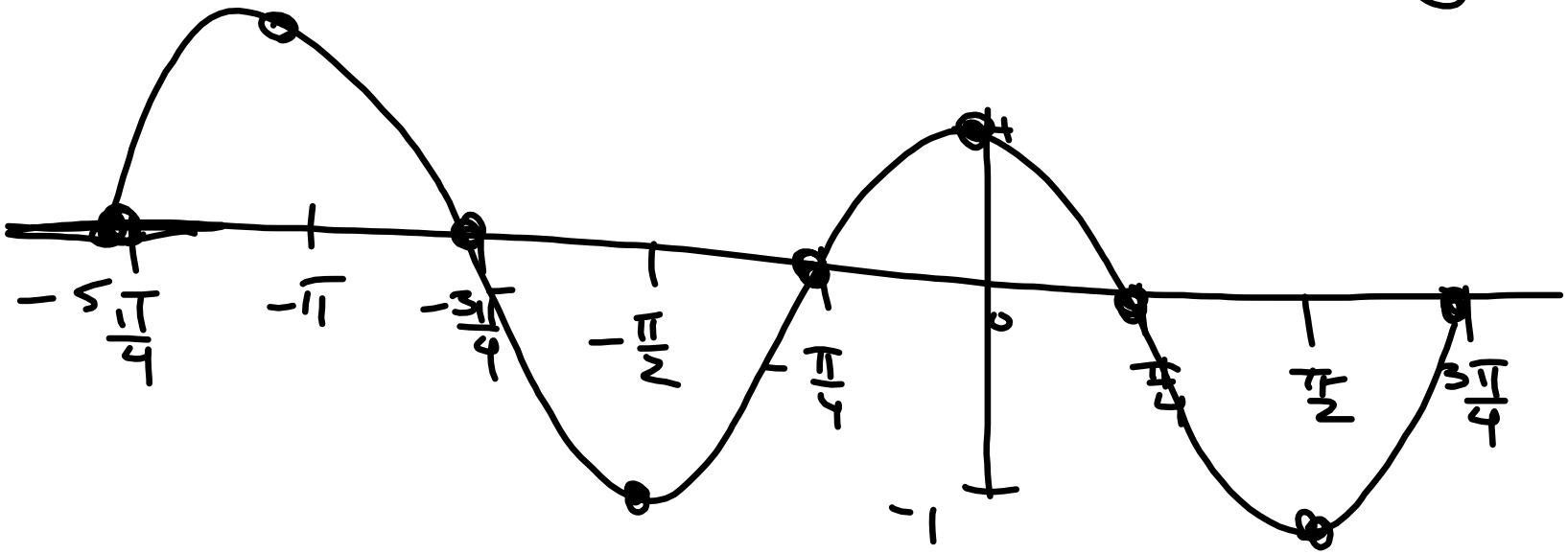
$$y = \sin\left(\theta - \frac{\pi}{4}\right)$$

$\theta - \frac{\pi}{4}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
θ	$\frac{\pi}{4}$	$\frac{3\pi}{4}$	$\frac{5\pi}{4}$	$\frac{7\pi}{4}$	$\frac{9\pi}{4}$
$\sin\theta$	0	1	0	-1	0



$$y = \sin\left(2\theta + \frac{\pi}{2}\right)$$

$2\theta + \frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
2θ	$-\frac{\pi}{2}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$
θ	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$
$\sin\theta$	0	1	0	-1	0



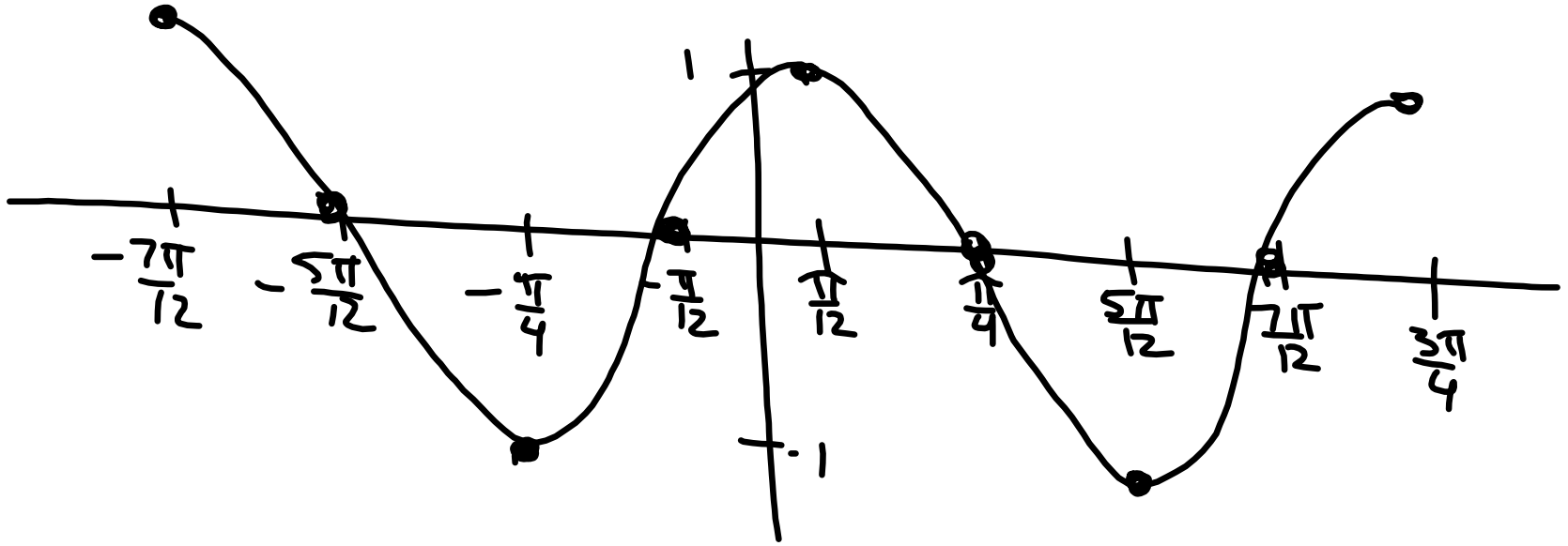
$$y = \cos\left(3\theta - \frac{\pi}{4}\right)$$

per. $= \frac{2\pi}{3}$

ph. sft: $\frac{\pi}{12}$ right

$3\theta - \frac{\pi}{4}$	0	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
3θ	$\frac{\pi}{4}$	$\frac{3\pi}{4}$	$\frac{5\pi}{4}$	$\frac{7\pi}{4}$	$\frac{9\pi}{4}$
θ	$\frac{\pi}{12}$	$\frac{\pi}{4}$	$\frac{5\pi}{12}$	$\frac{7\pi}{12}$	$\frac{3\pi}{4}$
$\cos\theta$	1	0	-1	0	1

θ	$\frac{\pi}{12}$	$\frac{\pi}{4}$	$\frac{5\pi}{12}$	$\frac{7\pi}{12}$	$\frac{3\pi}{4}$
$\cos\theta$	1	0	−1	0	1



$y = \tan\left(2\theta - \frac{\pi}{3}\right)$

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

ph. sft. $= \frac{\pi}{6}$ right

$2\theta - \frac{\pi}{3}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
2θ	$\frac{\pi}{3}$	$\frac{7\pi}{12}$	$\frac{5\pi}{6}$	$\frac{13\pi}{12}$	$\frac{4\pi}{3}$
θ	$\frac{\pi}{6}$	$\frac{7\pi}{24}$	$\frac{5\pi}{12}$	$\frac{13\pi}{24}$	$\frac{2\pi}{3}$
$\tan\theta$	0	1	U	-1	0

θ	$\frac{\pi}{6}$	$\frac{7\pi}{24}$	$\frac{5\pi}{12}$	$\frac{13\pi}{24}$	$\frac{2\pi}{3}$
$\tan\theta$	0	1	4	-1	0