Secant

1/cosine

$-1 \le \text{cosine} \le 1$

$\text{secant} \le -1$

$\text{secant} \ge 1$

$x \neq \frac{\pi}{2}, \frac{3\pi}{2}, \ldots, \frac{(2n+1)\pi}{2}$

Graph? 1st graph cosine.

Amplitude: $|A| = n/a$

Period: $P = \frac{2\pi}{|B|}$

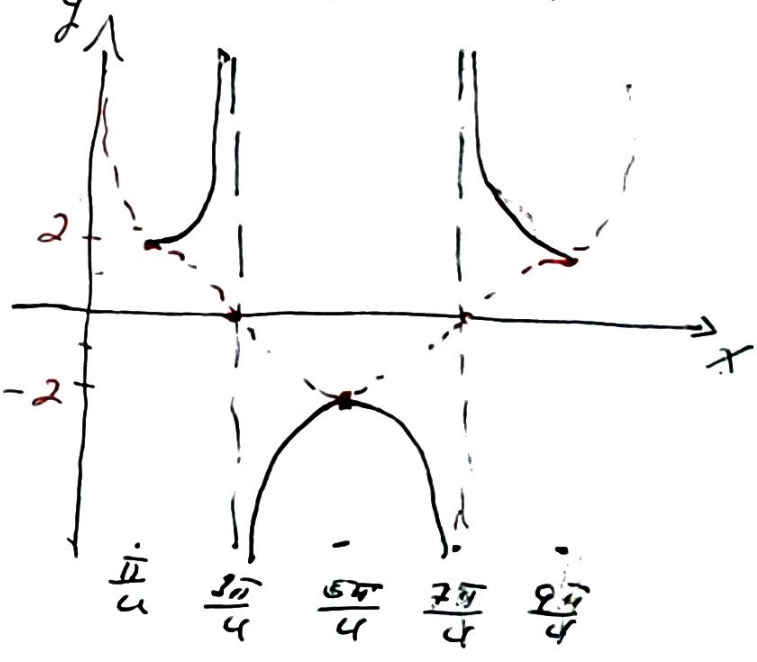
phase shift: $\phi = -\frac{C}{B}$ (so the argument (inside Trig))

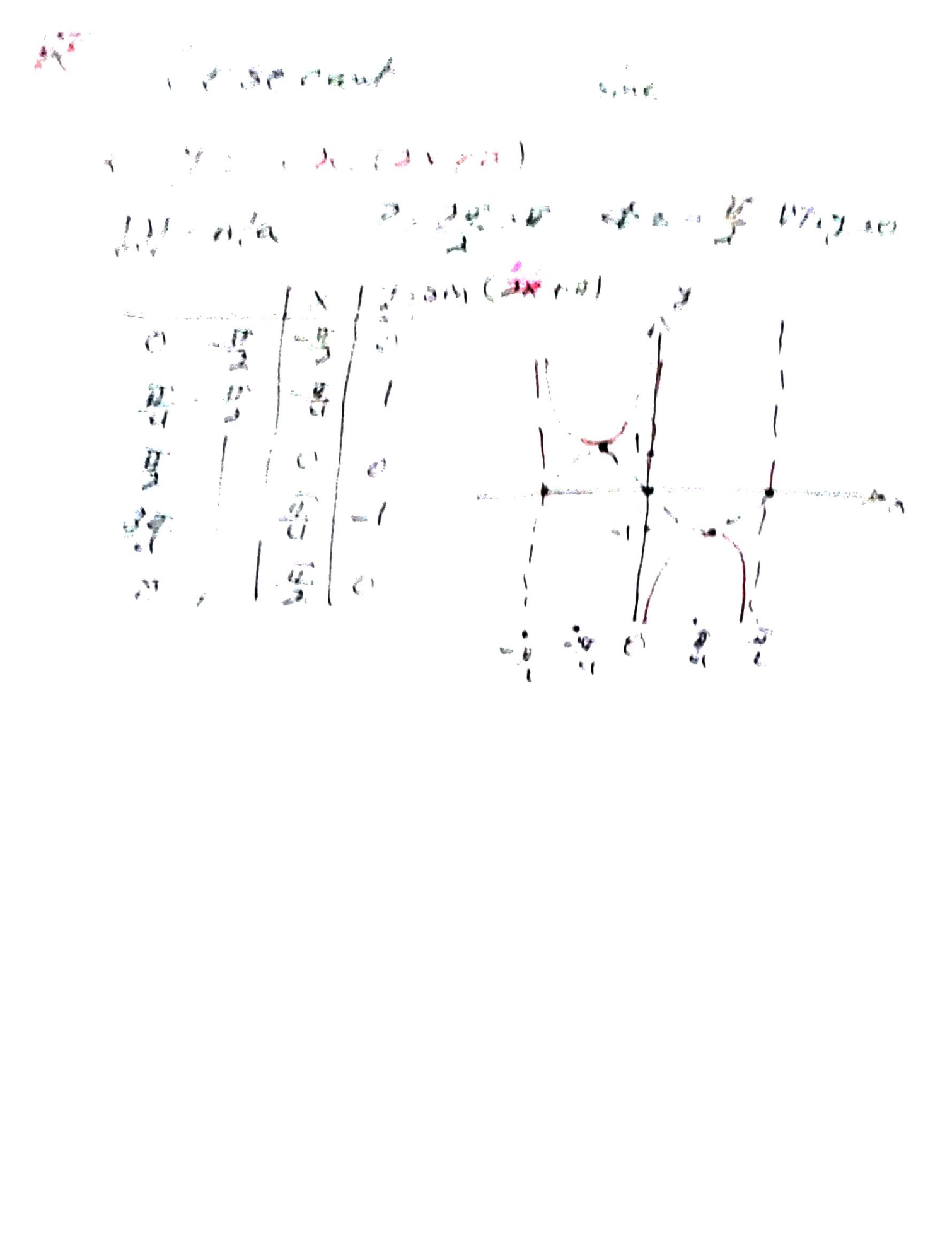
Vertical Translation: VT: $y = D$

Ex $y = 2\sec\left(x - \frac{\pi}{4}\right)$ $\left[2\cos\left(x - \frac{\pi}{4}\right)\right]$

$|A| = n/a$ $P = 2\pi$ $\phi = +\frac{\pi}{4}$ VT: $y = 0$

		x	y
0	$+\frac{\pi}{4}$	$\frac{\pi}{4}$	2
$\frac{\pi}{2}$	$+\frac{\pi}{4}$	$\frac{3\pi}{4}$	0
π		$\frac{5\pi}{4}$	−2
$\frac{3\pi}{2}$		$\frac{7\pi}{4}$	0
2π		$\frac{9\pi}{4}$	2



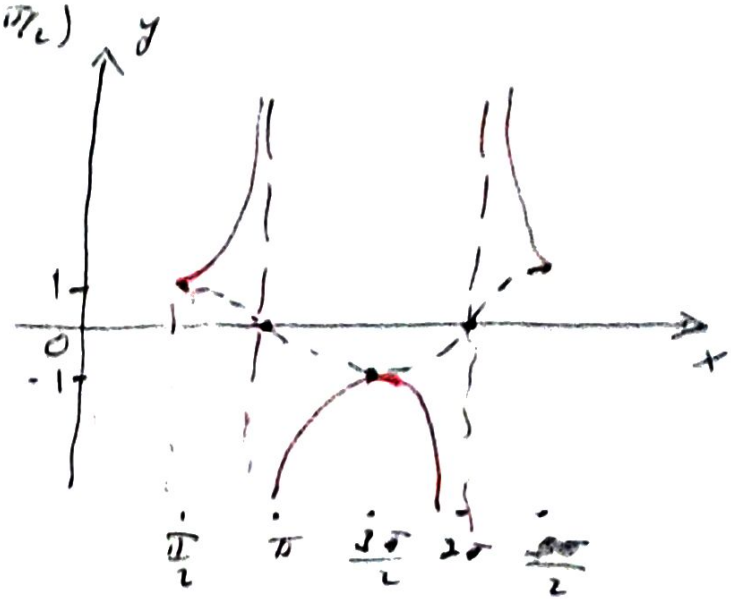


11.1 1.3

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

I.H = n/a $P = 2\pi$ $\phi = \frac{\pi}{2}$ V.T: $y = 0$

	x	$y = \cos(x - \pi/2)$
$0 + \frac{\pi}{2}$	$\frac{\pi}{2}$	1
$\frac{\pi}{2} + \frac{\pi}{2}$	π	0
π |	$\frac{3\pi}{2}$	−1
$\frac{3\pi}{2}$ |	2π	0
2π /	$\frac{5\pi}{2}$	1

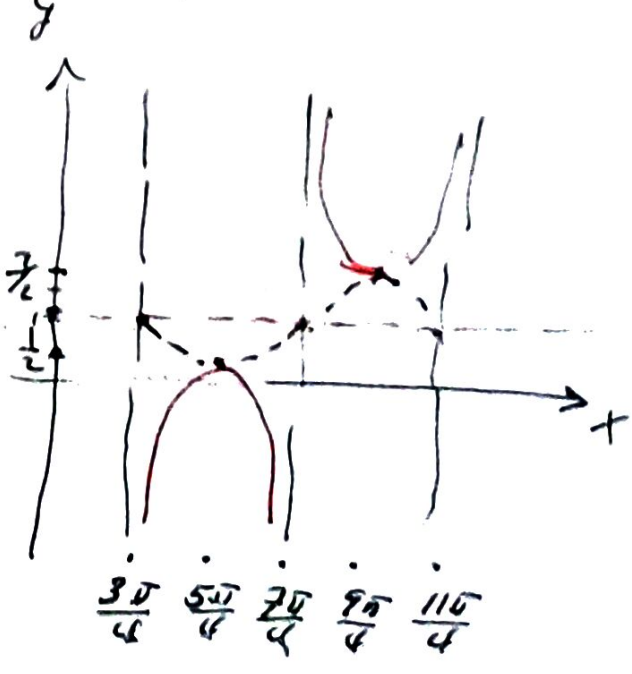


11.7

$y = 1 - \frac{1}{2}\csc\left(x - \frac{3\pi}{4}\right)$

I.H = n/a $P = 2\pi$ $\phi = \frac{3\pi}{4}$ V.T: $y = 1$

	x	$y = 1 - \frac{1}{2}\csc x$
$0 + \frac{3\pi}{4}$	$\frac{3\pi}{4}$	1
$\frac{\pi}{2} + \frac{3\pi}{4}$	$\frac{5\pi}{4}$	$1 - \frac{1}{2} = \frac{1}{2}$
π |	$\frac{7\pi}{4}$	1
$\frac{3\pi}{2}$ |	$\frac{9\pi}{4}$	$1 + \frac{1}{2} = \frac{3}{2}$
2π /	$\frac{11\pi}{4}$	1

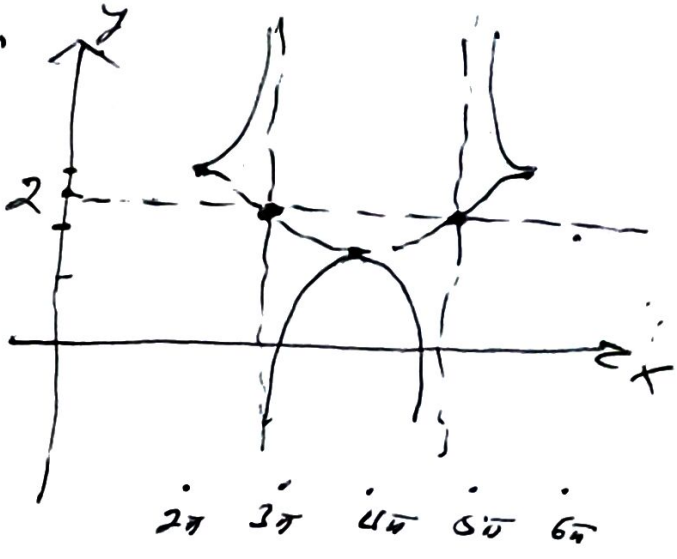


#8

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

$|A| = n/a \quad P = \frac{2\pi}{1/2} = 4\pi \quad \phi = 2\pi \quad VT,\ y = 2$

	x	$y = 2 + \frac{1}{4}\cos$
$0 \quad +2\pi$	2π	$2 + \frac{1}{4} = \frac{9}{4}$
$\pi \quad +2\pi$	3π	2
2π	4π	$2 - \frac{1}{4} = \frac{7}{4}$
3π	5π	2
4π	6π	$2 + \frac{1}{4} = \frac{9}{4}$

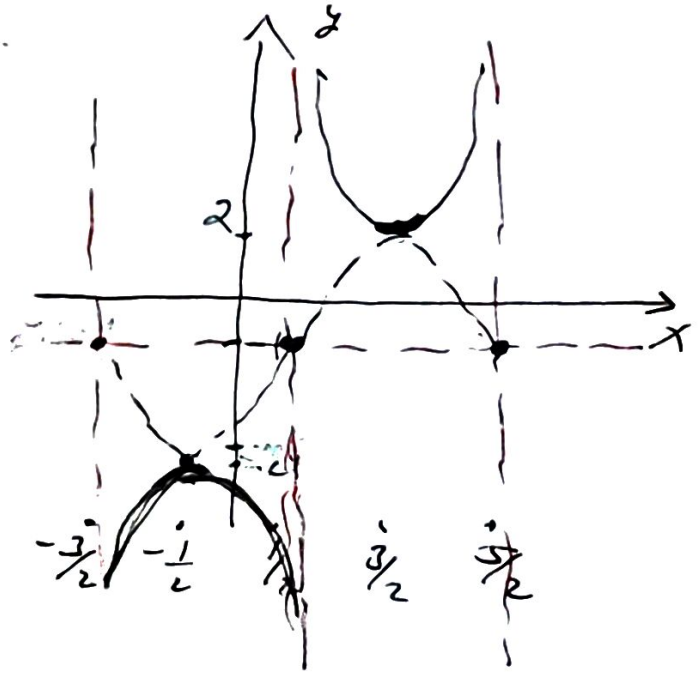


#9

$$y = -1 - 3\sin\left(\frac{\pi x}{2} + \frac{3\pi}{4}\right)$$

$|A| = n/a \quad P = \frac{2\pi}{\pi/2} = 4 \quad \phi = -\frac{3\pi}{4} \cdot \frac{2}{\pi} = -\frac{3}{2} \quad VT,\ y = -1$

	x	$y = -1 - 3\sin$
$0 \quad -\frac{3}{2}$	$-\frac{3}{2}$	-1
$1 \quad -\frac{3}{2}$	$-\frac{1}{2}$	$-1 - 3 = -4$
2	$\frac{1}{2}$	-1
3	$\frac{3}{2}$	$-1 + 3 = 2$
4	$\frac{5}{2}$	-1

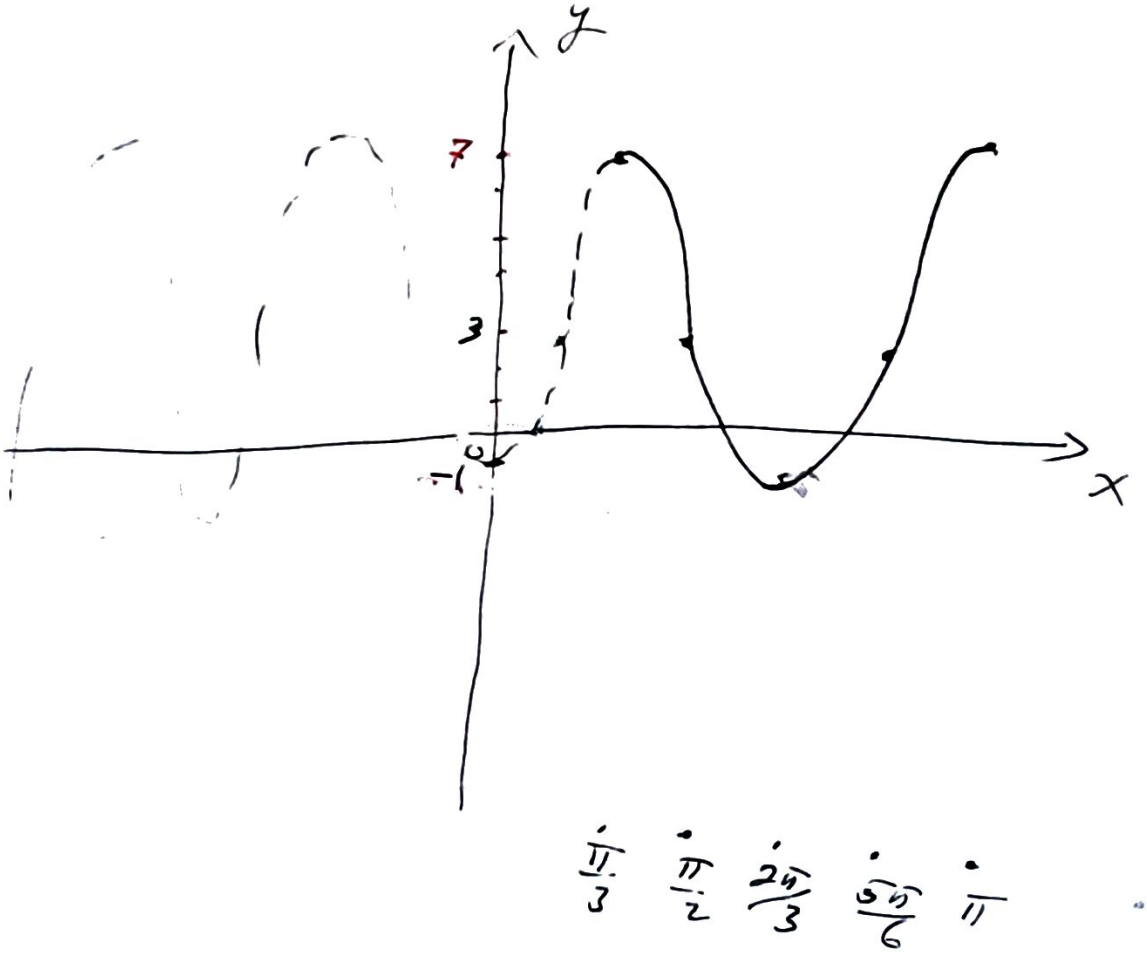


Work #11

$$y = 3 + 4\cos(3x - \pi)$$

$|A| = 4$ $\quad P = \frac{2\pi}{3}$ $\quad \phi = +\frac{\pi}{3}$ $\quad$ V.T: $y = 3$

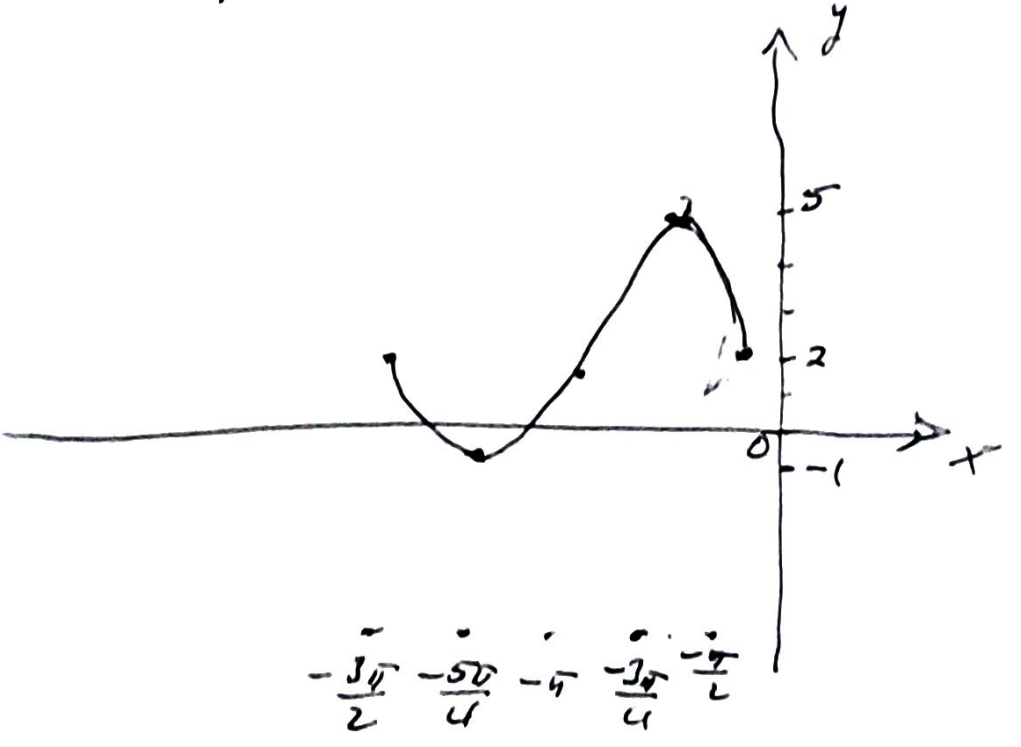
	x	y
$0 \quad +\frac{\pi}{3}$	$\frac{\pi}{3}$	$3 + 4 = 7$
$\frac{\pi}{6} \quad +\frac{\pi}{3}$	$\frac{\pi}{2}$	3
$\frac{\pi}{3}$	$\frac{2\pi}{3}$	$3 - 4 = -1$
$\frac{\pi}{2}$	$\frac{5\pi}{6}$	3
$\frac{2\pi}{3}$	π	$3 + 4 = 7$

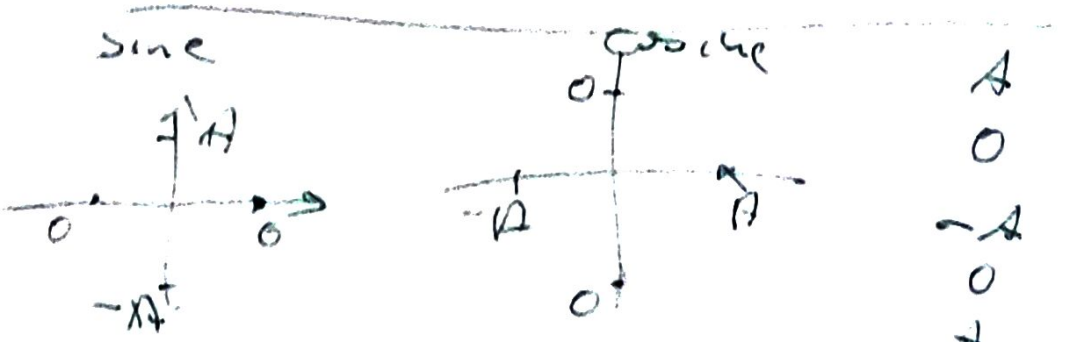


$$f = 2(-3)\sin(2x + 3\pi)$$

$|A| = 3 \quad P = \pi \quad \phi = -\frac{3\pi}{2} \quad \text{V.S: } y = 2$

	x	y	
$0 - \frac{3\pi}{2}$	$-\frac{3\pi}{2}$	2	
$\frac{\pi}{4} - \frac{3\pi}{2}$	$-\frac{5\pi}{4}$	$2 - 3 = -1$	V
$\frac{\pi}{2}$	$-\pi$	2	0
$\frac{3\pi}{4}$	$-\frac{3\pi}{4}$	$2 + 3 = 5$	^ V
π	$-\frac{\pi}{2}$	2	0





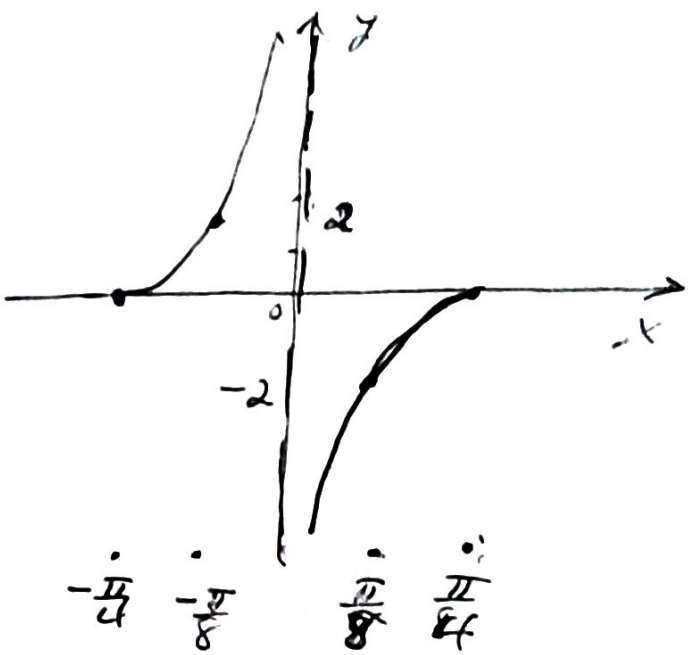
~~#72~~ 3, 5, 10,

I.2 #2

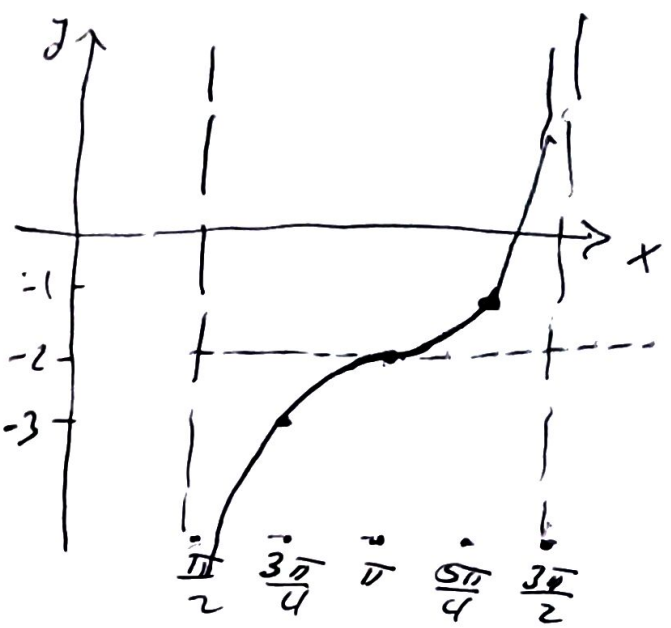
$$y = 2\tan\left(2x + \frac{\pi}{2}\right)$$

$|A| = n/a \quad P = \frac{\pi}{2} \quad \phi = -\frac{\pi}{4}$ VT. $y = 0$.

		x	y
0	$-\frac{\pi}{4}$	$-\frac{\pi}{4}$	0
$\frac{\pi}{8}$	$-\frac{\pi}{4}$	$-\frac{\pi}{8}$	2
$\frac{\pi}{4}$	|	0	∞
$\frac{3\pi}{8}$	|	$\frac{\pi}{8}$	-2
$\frac{\pi}{2}$	↓	$\frac{\pi}{4}$	0



7.2 #9 $y = -2 - \cot\left(x - \frac{\pi}{2}\right)$

$|A| = n/a \quad P = \pi \quad \phi = \frac{\pi}{2} \quad VT: y = -2$

		x	y
0	$+\frac{\pi}{2}$	$\frac{\pi}{2}$	∞
$\frac{\pi}{4}$	$+\frac{\pi}{2}$	$\frac{3\pi}{4}$	$-2-1=-3$
$\frac{\pi}{2}$		π	-2
$\frac{3\pi}{4}$		$\frac{5\pi}{4}$	$-2+1=-1$
π		$\frac{3\pi}{2}$	∞