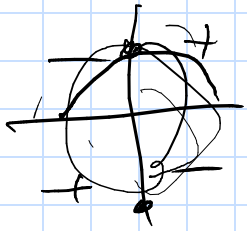
7-2 Tangent & Cotagent.

	sine	cosine	tangent	cotagent
0	0	A	0	∞
$\frac{1}{6}P$	A	0	A	A
$\frac{1}{2}P$	0	-A	∞	0
$\frac{3}{6}P$	-A	0	-A	-A
P	0	A	0	∞ ←

Tangent: cotagent

$$P = \frac{\pi}{|B|}$$

$$|A| = \text{none}$$



$$\phi = -\frac{C}{B} \qquad VT: y = D$$

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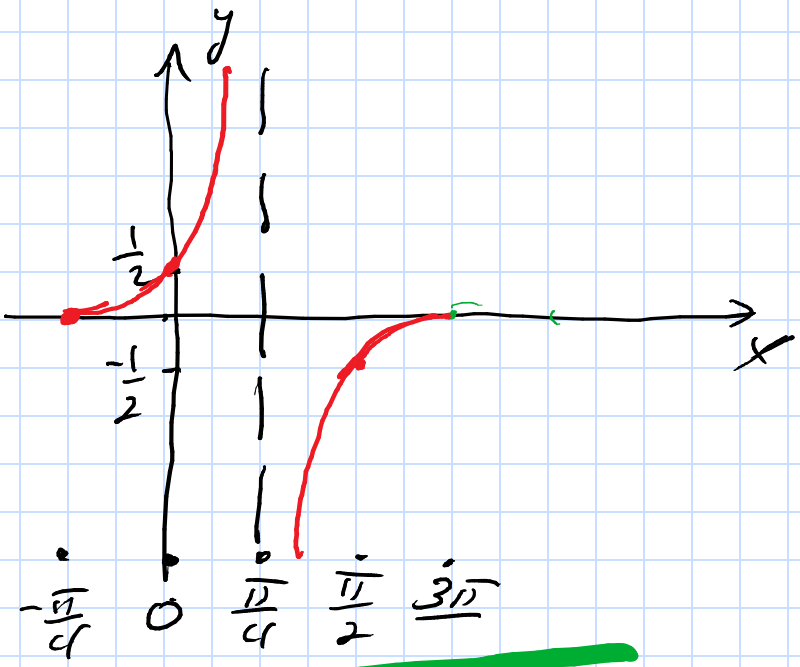
tangent: ∞ $x = \frac{(2n+1)\pi}{2}$ Asymptote

x intercept: $n\pi = x$

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

$|A| = \text{none}$ $P = \frac{\pi}{B} = \frac{\pi}{1} = \pi$ $\phi = -\frac{C}{B} = -\frac{\pi}{4}$ V.S: $y = 0$

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

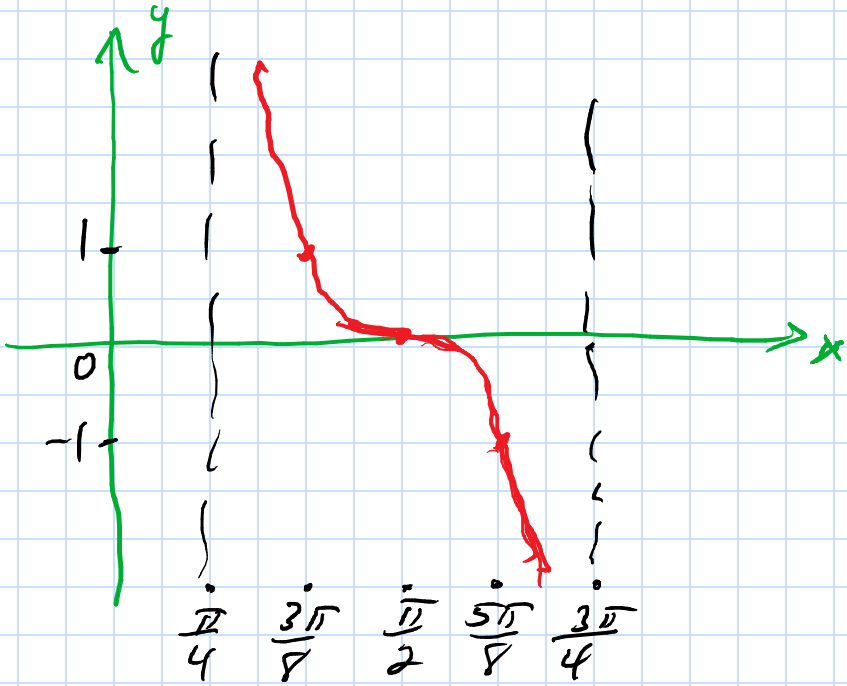


$y = \cot\left(2x - \frac{\pi}{2}\right)$ 1-cycle +↑

$|A| = \text{none}$ $P = \frac{\pi}{B} = \frac{\pi}{2}$ $\phi = +\frac{\pi}{2} \cdot \frac{1}{2} = \frac{\pi}{4} = -\frac{C}{B}$

V.T: $y = 0$

		x	y
0	$+\frac{\pi}{4}$	$\frac{\pi}{4}$	∞
$\frac{\pi}{8}$	$+\frac{\pi}{4}$	$\frac{3}{8}\pi$	1
$\frac{\pi}{4}$		$\frac{\pi}{2}$	0
$\frac{3\pi}{8}$		$\frac{5\pi}{8}$	-1
$\frac{\pi}{2}$		$\frac{3\pi}{4}$	∞

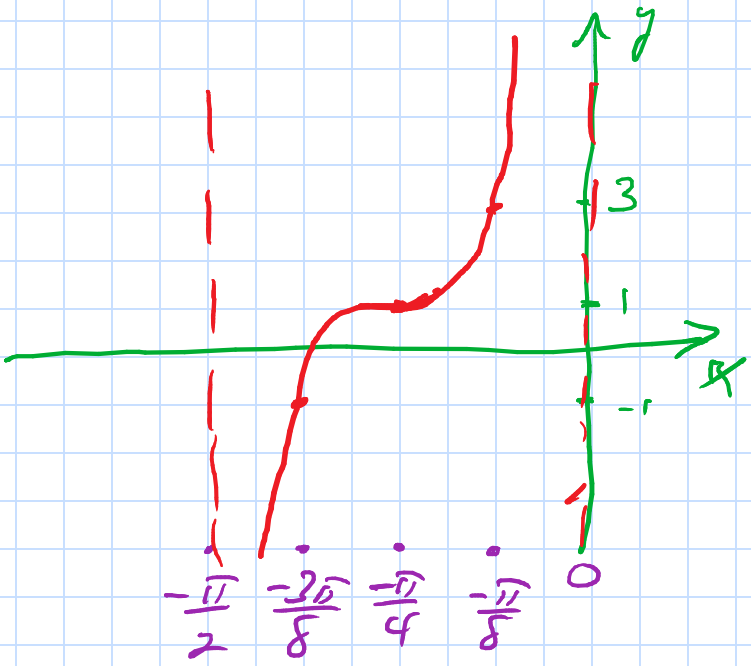


#17 $y = 1 - 2\cot 2\left(x + \frac{\pi}{2}\right)$ 1-cycle

$= 1 - 2\cot(2x + \pi)$

$|A| = \text{none}$ $P = \frac{\pi}{b} = \frac{\pi}{2}$ $\varphi = -\frac{c}{b} = -\frac{\pi}{2}$ VI: $y = 1$

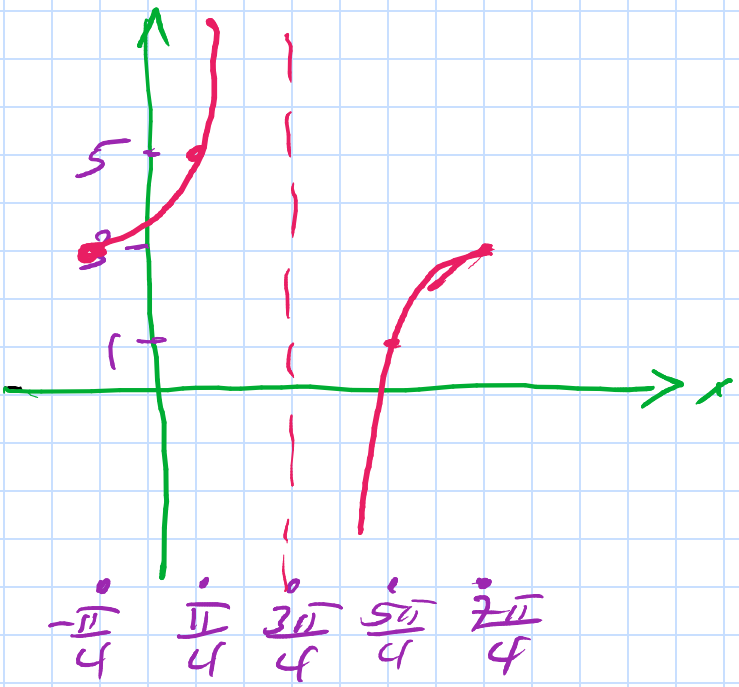
	x	y
$0 - \frac{\pi}{2}$	$-\frac{\pi}{2}$	∞
$\frac{\pi}{8} - \frac{\pi}{2}$	$-\frac{3\pi}{8}$	$-2+1=-1$
$\frac{\pi}{4}$	$-\frac{\pi}{4}$	$0+1=1$
$\frac{3\pi}{8}$	$-\frac{\pi}{8}$	$2+1=3$
$\frac{\pi}{2}$	0	∞



10/ $y = 3 + 2\tan\left(\frac{x}{2} + \frac{\pi}{8}\right)$

$|A| = \text{none}$ $P = \frac{\pi}{b} = 2\pi$ $\varphi = -\frac{c}{b} = -\frac{\pi}{4}$ VI: $y = 3$

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



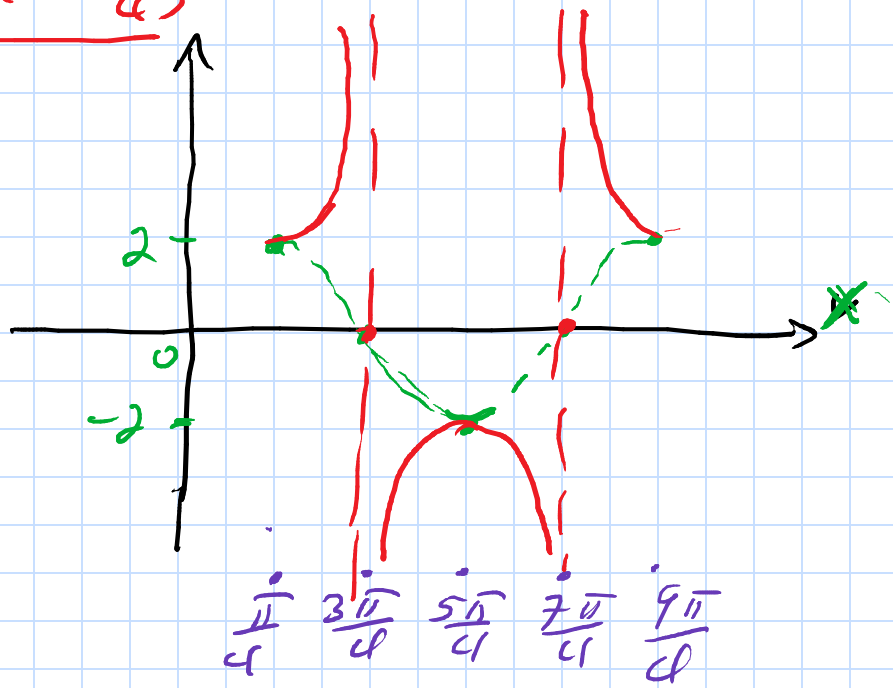
7.3 Secant $\left(\frac{1}{\text{Cosine}}\right)$

$|A| = \text{none}$ $P = \frac{2\pi}{B}$ $\phi = -\frac{C}{B}$ V.T: $y = D$

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

$|A| = \text{none}$ $P = 2\pi$ $\phi = \frac{\pi}{4}$ V.T: $y = 0$

	x	$y = 2\cos\left(x - \frac{\pi}{4}\right)$
$0 + \frac{\pi}{4}$	$\frac{\pi}{4}$	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

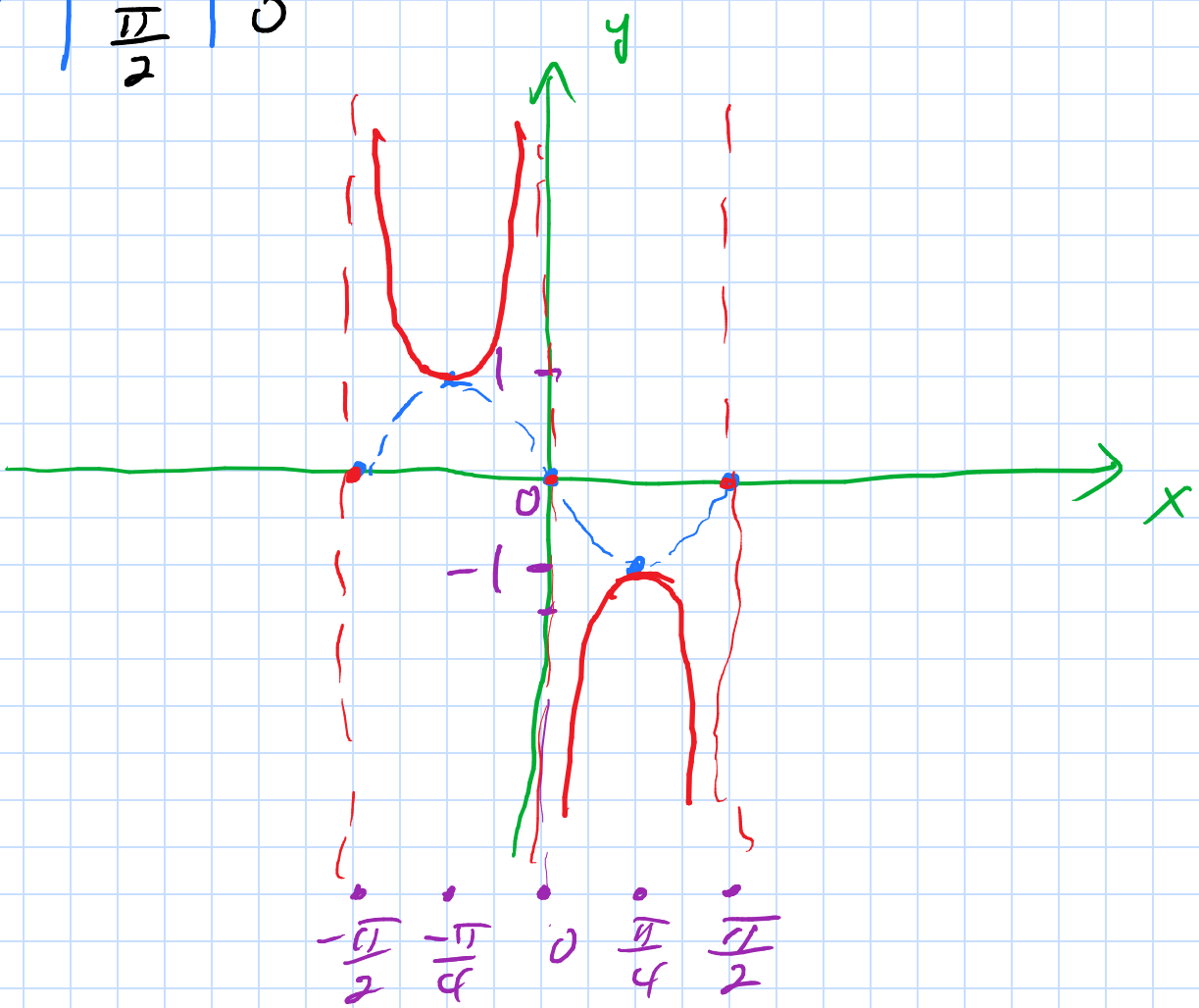


Cosecant $|A| = \text{none}$ $\left(\frac{1}{\text{Sine}}\right)$

Ex $y = \csc(2x + \pi)$

$|A| = \text{none}$ $P = \frac{2\pi}{2} = \pi$ $\phi = -\frac{\pi}{2}$ V.T: $y = 0$

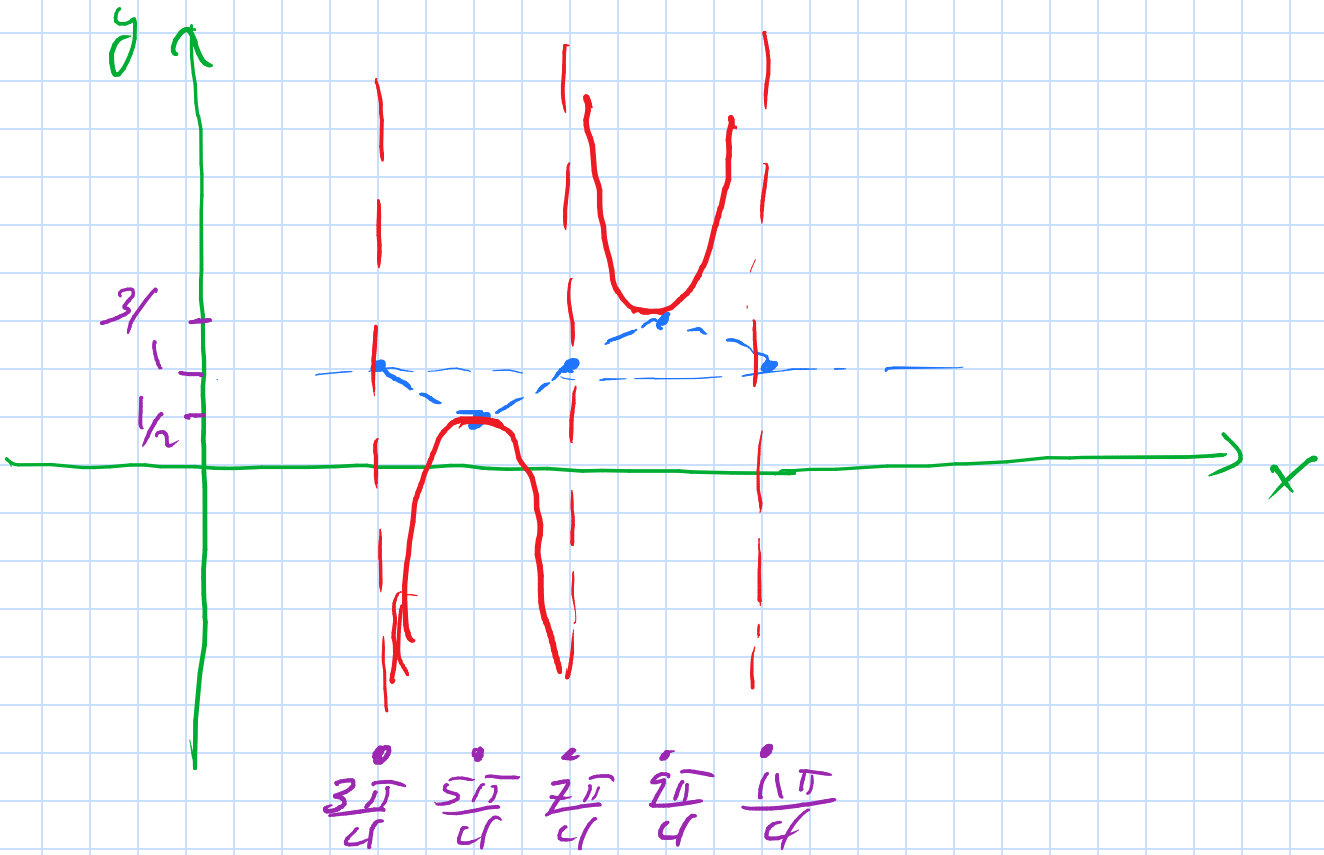
		x	$y = \sin(2x + \pi)$
0	$-\frac{\pi}{2}$	$-\frac{\pi}{2}$	0
$\frac{\pi}{4}$	$-\frac{\pi}{2}$	$-\frac{\pi}{4}$	1
$\frac{\pi}{2}$		0	0
$\frac{3\pi}{4}$		$\frac{\pi}{4}$	-1
π		$\frac{\pi}{2}$	0



7/ $y = 1 - \frac{1}{2}\cos\left(x - \frac{3\pi}{4}\right)$ 1-cycle

$|A| = \text{none}$ $P = 2\pi$ $\phi = \frac{3\pi}{4}$ V.T: $y = 1$

	x	$y = 1 - \frac{1}{2}\sin\left(x - \frac{3\pi}{4}\right)$	
$0 + \frac{3\pi}{4}$	$\frac{3\pi}{4}$	$0 + 1$	1
$\frac{\pi}{2} + \frac{3\pi}{4}$	$\frac{5\pi}{4}$	$-\frac{1}{2} + 1$	$\frac{1}{2}$
π	$\frac{7\pi}{4}$	$0 + 1$	1
$\frac{3\pi}{2}$	$\frac{9\pi}{4}$	$\frac{1}{2} + 1$	$3/2$
2π	$\frac{11\pi}{4}$	$0 + 1$	1

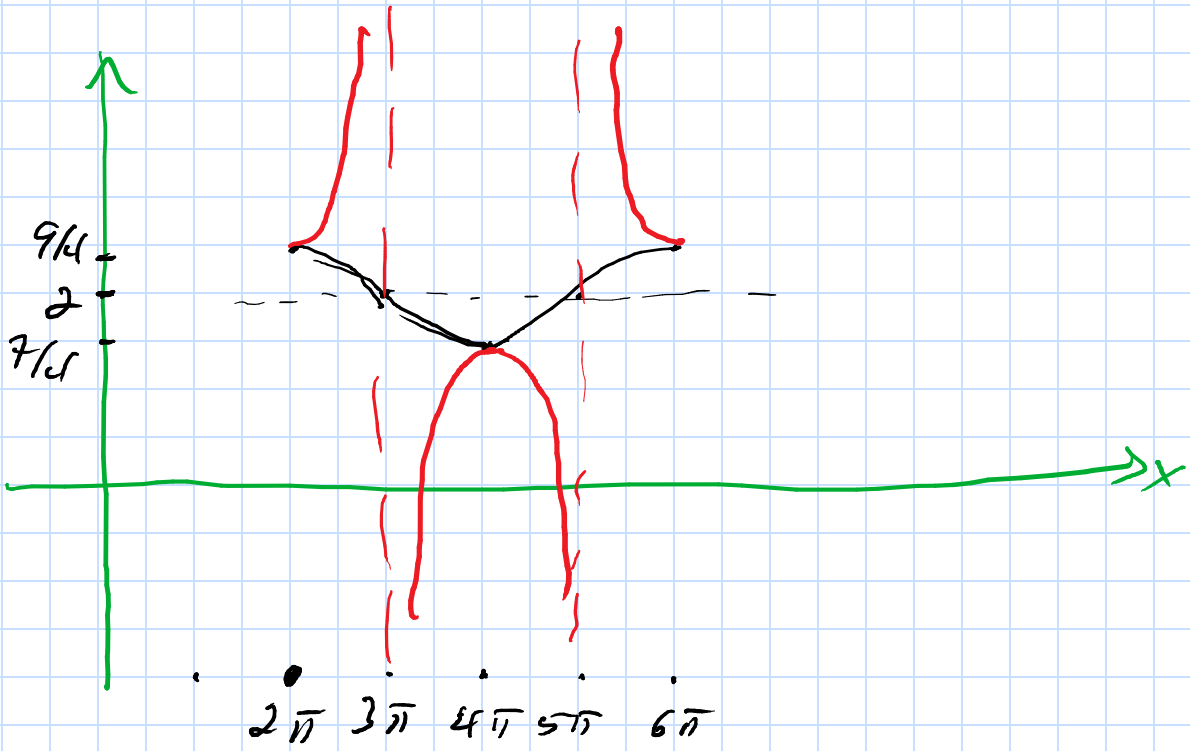


8/ $y = 2 + \frac{1}{4}\sec\left(\frac{1}{2}x - \pi\right)$ 1-cycle

$|A| = \text{none}$ $P = \frac{2\pi}{\frac{1}{2}} = 4\pi$ $\phi = 2\pi = +\frac{\pi}{\frac{1}{2}}$

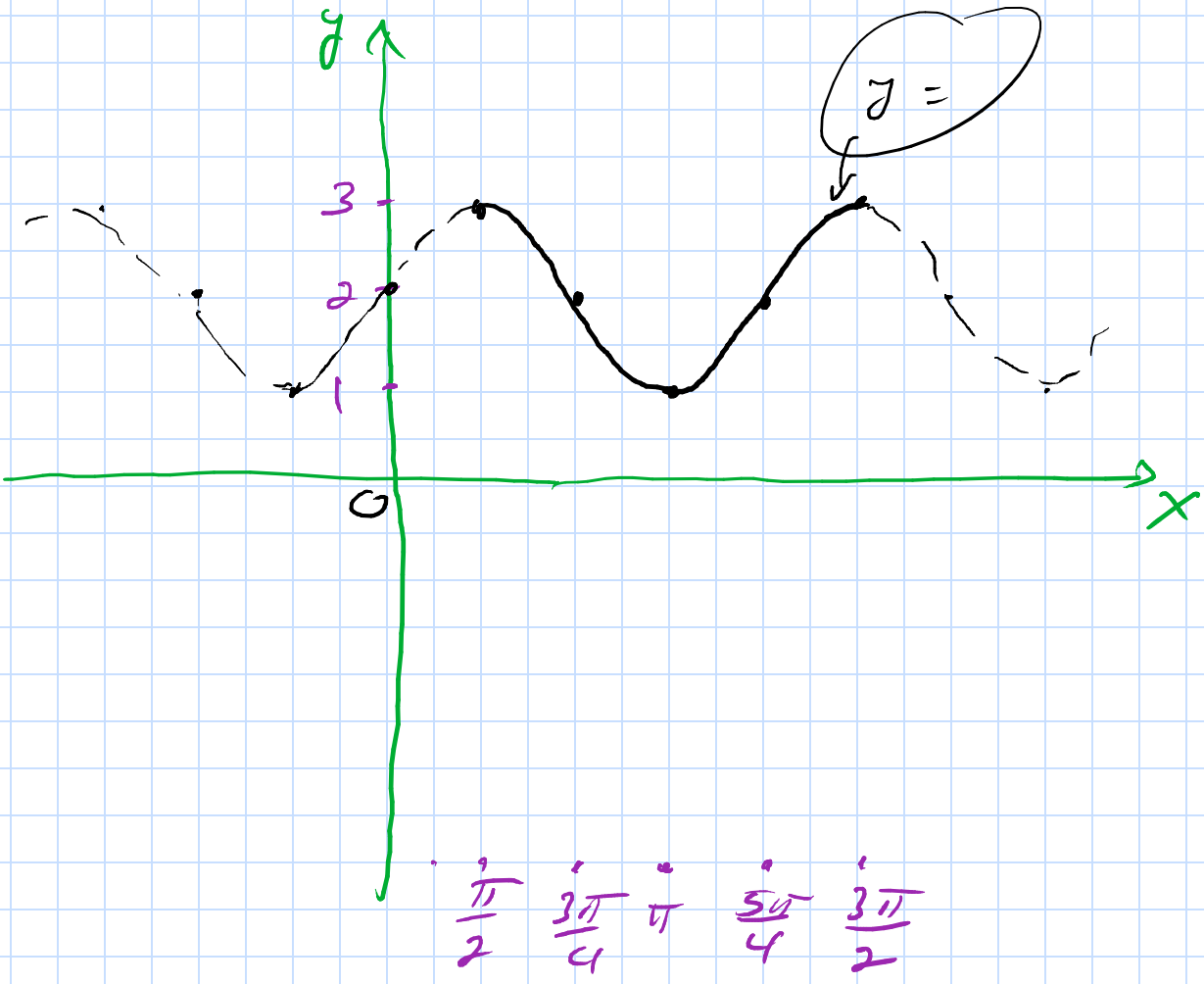
V.T: $y = 2$

		x	$y = 2 + \frac{1}{4}\cos\left(\frac{1}{2}x - \pi\right)$	
0	$+2\pi$	2π	$\frac{1}{4} + 2$	$9/4$
π	$+2\pi$	3π	$0 + 2$	2
2π		4π	$-\frac{1}{4} + 2$	$7/4$
3π		5π	$0 + 2$	2
4π		6π	$\frac{1}{4} + 2$	$9/4$



7.1 #18

$y = \cos(2x - \pi) + 2$

$|A| = 1 \quad P = \frac{2\pi}{2} = \pi \quad \phi = \frac{\pi}{2} \quad V.T.: y = 2$

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