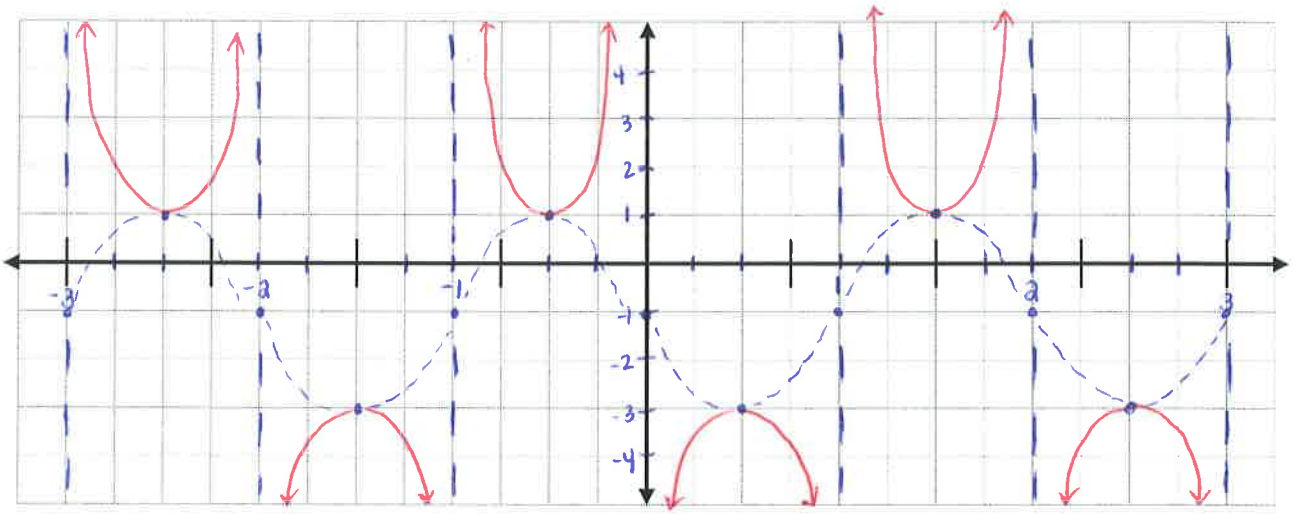
Pre-Calculus A
4.6 Graphing Quiz Review Part 1

Name : Key
Date : _____

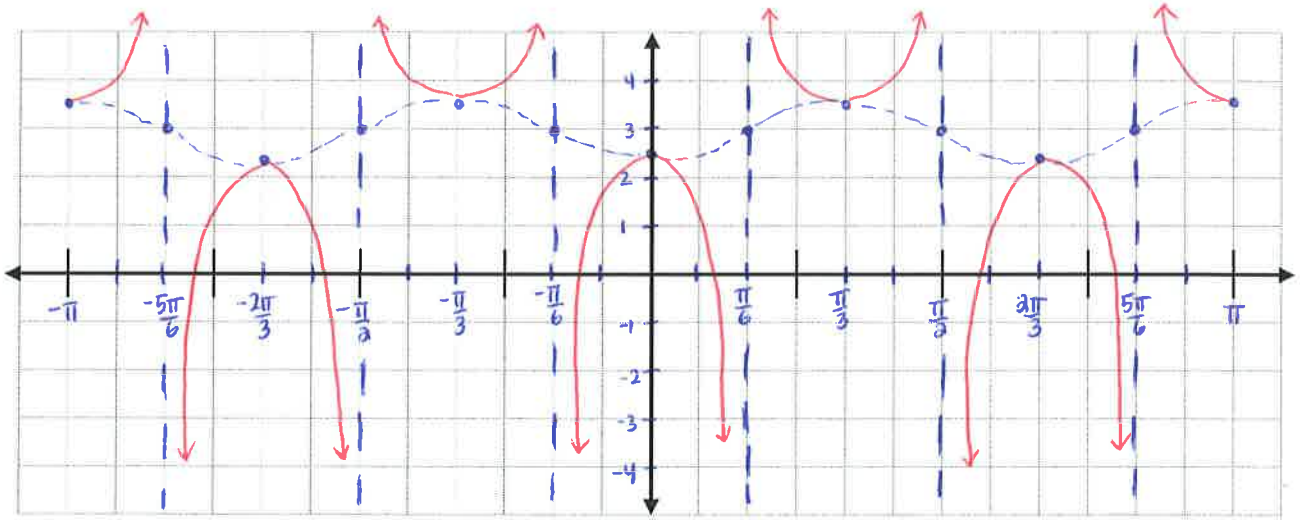
Please graph TWO FULL PERIODS of the following functions. Be sure to identify your asymptotes and find the domain, range and period. Do all work on a separate sheet of paper.

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



Period : $\frac{2\pi}{b} = \frac{2\pi}{\pi} = 2$ Range : $(-\infty, -3] \cup [1, \infty)$ Domain : $\mathbb{R}$ except $1n$

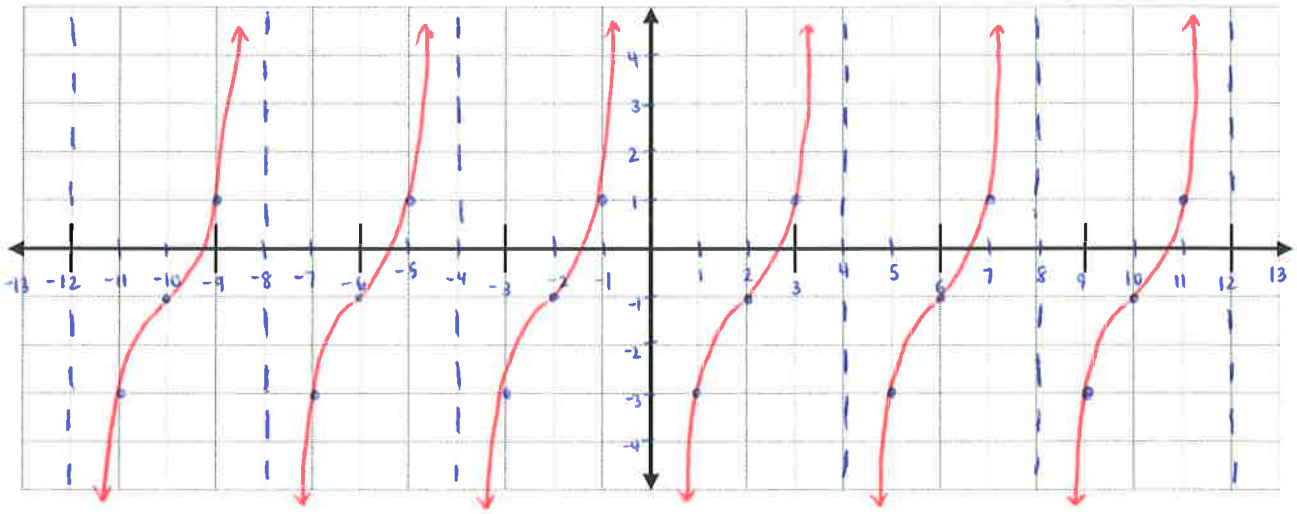
2. $y = \frac{1}{2}\csc\left(3x - \frac{\pi}{2}\right) + 3$



Period = $\frac{2\pi}{b} = \frac{2\pi}{3}$ Range: $(-\infty, 2.5] \cup [3.5, \infty)$ Domain: $\mathbb{R}$ except $\frac{\pi}{6} + \frac{2\pi}{3}n$

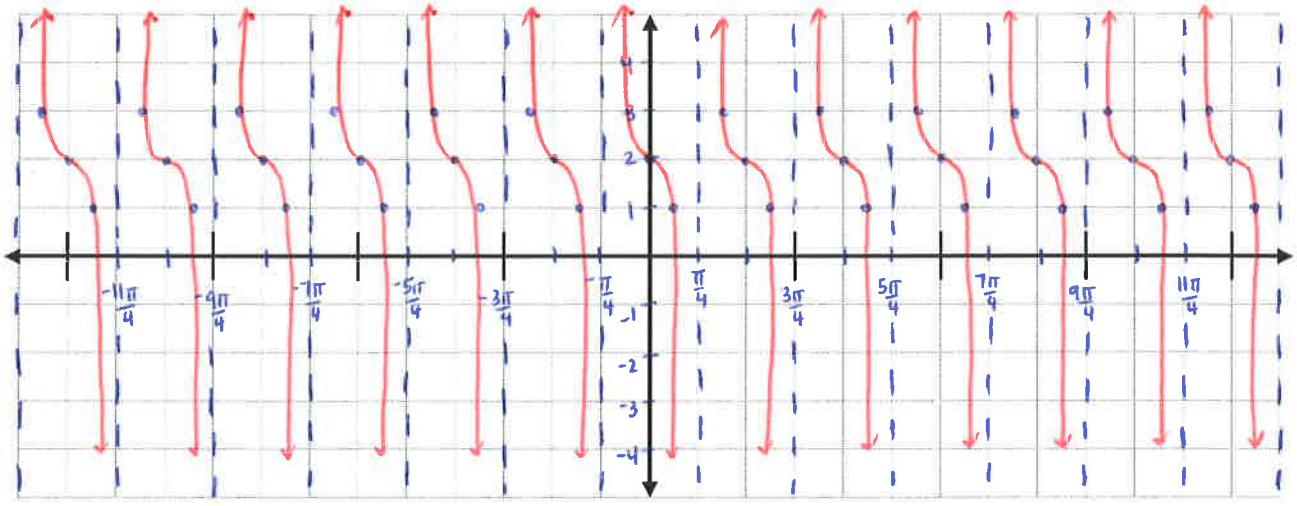
↱ increasing

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



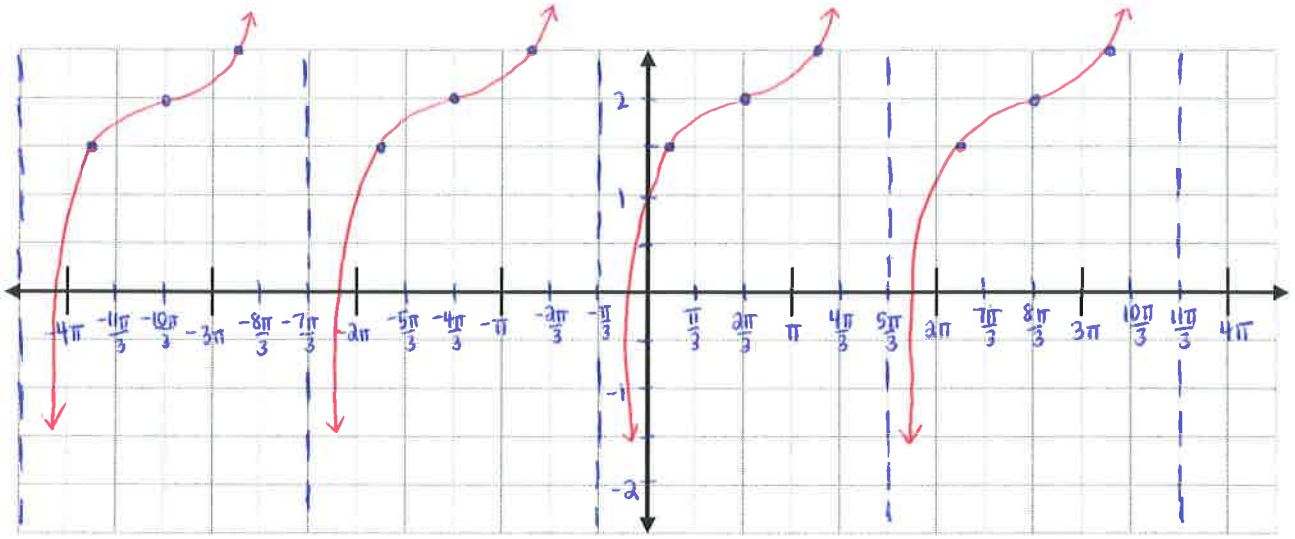
Period = 4-0 = 4 Range: $(-\infty, \infty)$ Domain: $\mathbb{R}$ except $4n$

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



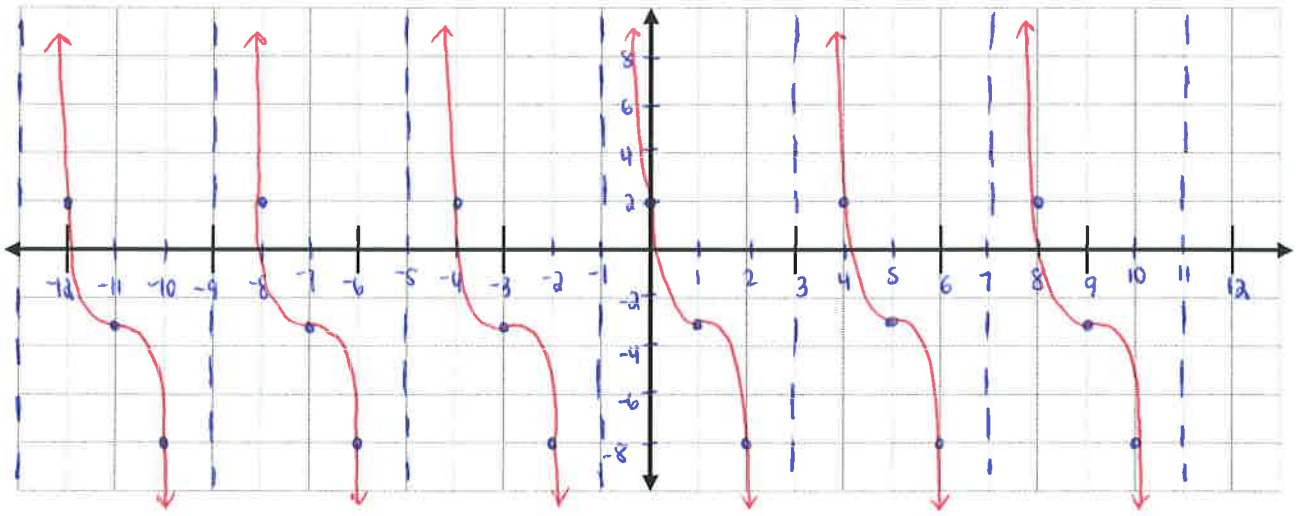
Period = $\frac{3\pi}{4} - \frac{\pi}{4} = \frac{2\pi}{4} = \frac{\pi}{2}$ Range: $(-\infty, \infty)$ Domain: $\mathbb{R}$ except $\frac{\pi}{4} + \frac{\pi}{2}n$

5. $y = \frac{1}{2}\tan\left(\frac{x}{2} + \frac{2\pi}{3}\right) + 2$



Period = $\frac{11\pi}{3} - \frac{5\pi}{3} = \frac{6\pi}{3} = 2\pi$ Range: $(-\infty, \infty)$ Domain: IR except $\frac{5\pi}{3} + 2\pi n$

6. $y = 5\cot\left(\frac{\pi}{4}x + \frac{\pi}{4}\right) - 3$



Period = 7-3 = 4 Range: $(-\infty, \infty)$ Domain: IR except $3 + 4n$

↱ cosine

① $-1-2\sec\left(\pi x-\frac{\pi}{2}\right)$

$\pi x-\frac{\pi}{2}=0$ $\quad \pi x-\frac{\pi}{2}=\frac{\pi}{2}$ $\quad \pi x-\frac{\pi}{2}=\pi$ $\quad \pi x-\frac{\pi}{2}=\frac{3\pi}{2}$ $\quad \pi x-\frac{\pi}{2}=2\pi$

$\frac{1}{\pi}\frac{\pi x}{1}=\frac{\pi}{2}\cdot\frac{1}{\pi}$ $\quad \frac{\pi x}{\pi}=\frac{\pi}{\pi}$ $\quad \frac{1}{\pi}\frac{\pi x}{1}=\frac{3\pi}{2}\cdot\frac{1}{\pi}$ $\quad \frac{\pi x}{\pi}=\frac{2\pi}{\pi}$ $\quad \frac{1}{\pi}\frac{\pi x}{1}=\frac{5\pi}{2}\frac{1}{\pi}$

$x=1/2$ $\quad x=1$ $\quad x=3/2$ $\quad x=2$ $\quad x=5/2$

	new x	x axis	y axis	$-2y$	$-2y-1$
	$1/2$	0	1	-2	-3
asymptote →	1	$\pi/2$	(0)	0	-1
	$3/2$	π	-1	2	1
asymptote →	2	$3\pi/2$	(0)	0	-1
	$5/2$	2π	1	-2	-3

↱ sine

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

$3x-\frac{\pi}{2}=0$ $\quad 3x-\frac{\pi}{2}=\frac{\pi}{2}$ $\quad 3x-\frac{\pi}{2}=\pi$ $\quad 3x-\frac{\pi}{2}=\frac{3\pi}{2}$ $\quad 3x-\frac{\pi}{2}=2\pi$

$3x=\frac{\pi}{2}$ $\quad 3x=\pi$ $\quad 3x=\frac{3\pi}{2}$ $\quad 3x=2\pi$ $\quad 3x=\frac{5\pi}{2}$

$x=\frac{\pi}{3}\cdot\frac{1}{3}$ $\quad x=\pi/3$ $\quad x=\frac{3\pi}{2}\cdot\frac{1}{3}$ $\quad x=\frac{2\pi}{3}$ $\quad x=\frac{5\pi}{2}\cdot\frac{1}{3}$

$x=\frac{\pi}{6}$ $\quad x=\frac{\pi}{2}$ $\quad x=5\pi/6$

	new x	x axis	y axis	$\frac{1}{2}y$	$\frac{1}{2}y+3$
asymptote →	$\pi/6$	0	(0)	0	3
	$\pi/3$	$\frac{\pi}{2}$	1	0.5	3.5
asymptote →	$\pi/2$	π	(0)	0	3
	$2\pi/3$	$3\pi/2$	-1	-0.5	2.5
asymptote →	$5\pi/6$	2π	(0)	0	3

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

$\frac{\pi x}{4}-\frac{\pi}{2}=\frac{-\pi}{2}$ $\quad \frac{\pi x}{4}-\frac{\pi}{2}=\frac{\pi}{2}$

$\frac{\pi x}{4}=0$ $\quad \frac{\pi x}{4}=\frac{\pi}{1}$

$0=\pi x$ $\quad \frac{4\pi}{\pi}=\frac{\pi x}{\pi}$

$x=0$ $\quad x=4$

consecutive asymptotes at $x=0$, $x=4$

midpoint: -1

1st Q. Point: $-1\times 2=-2-1=-3$

2nd Q. Point: $1\times 2=2-1=1$

④ $\cot\left(2x-\frac{\pi}{2}\right)+2$

$2x-\frac{\pi}{2}=0$ $\quad 2x-\frac{\pi}{2}=\pi$

$2x=\frac{\pi}{2}$ $\quad 2x=\frac{3\pi}{2}$

$x=\frac{3\pi}{4}$

$x=\frac{\pi}{2}\cdot\frac{1}{2}$

$x=\frac{\pi}{4}$

Consecutive Asymptotes at $x=\frac{\pi}{4}$, $x=\frac{3\pi}{4}$

midpoint: 2

1st Q. Point: $1+2=3$

2nd Q. Point: $-1+2=1$

⑤ $\frac{1}{2}\tan\left(\frac{x}{2}+\frac{2\pi}{3}\right)+2$

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

$\frac{x}{2}=-\frac{\pi}{2}-\frac{2\pi}{3}$ $\quad \frac{x}{2}=\frac{\pi}{2}-\frac{2\pi}{3}$

$\frac{x}{2}=-\frac{3\pi}{6}-\frac{4\pi}{6}$ $\quad \frac{x}{2}=\frac{3\pi}{6}-\frac{4\pi}{6}$

$\frac{2}{1}\cdot\frac{x}{2}=-\frac{7\pi}{6}\cdot\frac{2}{1}$ $\quad \frac{2}{1}\cdot\frac{x}{2}=-\frac{\pi}{6}\cdot\frac{2}{1}$

$x=-\frac{14\pi}{6}=-\frac{7\pi}{3}$ $\quad x=-\frac{2\pi}{6}=-\frac{\pi}{3}$

Consecutive Asymptotes at $x=-\frac{7\pi}{3}$, $x=-\frac{\pi}{3}$

midpoint: 2

1st Q. Point: $-1\times\frac{1}{2}=-\frac{1}{2}+2=1.5$

2nd Q. Point: $1\times\frac{1}{2}=\frac{1}{2}+2=2.5$

⑥ $5\cot\left(\frac{\pi}{4}x+\frac{\pi}{4}\right)-3$

$\frac{\pi}{4}x+\frac{\pi}{4}=0$ $\quad \frac{\pi}{4}x+\frac{\pi}{4}=\pi$

$\frac{4}{\pi}\cdot\frac{\pi}{4}x=-\frac{\pi}{4}\cdot\frac{4}{\pi}$ $\quad \frac{4}{\pi}\cdot\frac{\pi}{4}x=\frac{3\pi}{4}\cdot\frac{4}{\pi}$

$x=\frac{-4\pi}{4\pi}=-1$ $\quad x=3$

Consecutive Asymptotes: $x=-1$, $x=3$

midpoint: -3

1st Q. Point: $1\times5=5-3=2$

2nd Q. Point: $-1\times5=-5-3=-8$