

KEY

Math Analysis (X)

Worksheet ~~37~~

Mrs. Pretz 4.2

Graph each of the following for one period. Make sure you label the major points on the x and y axes, and the asymptotes.

1. $y = \tan(x + \pi/3)$

Amplitude - 1

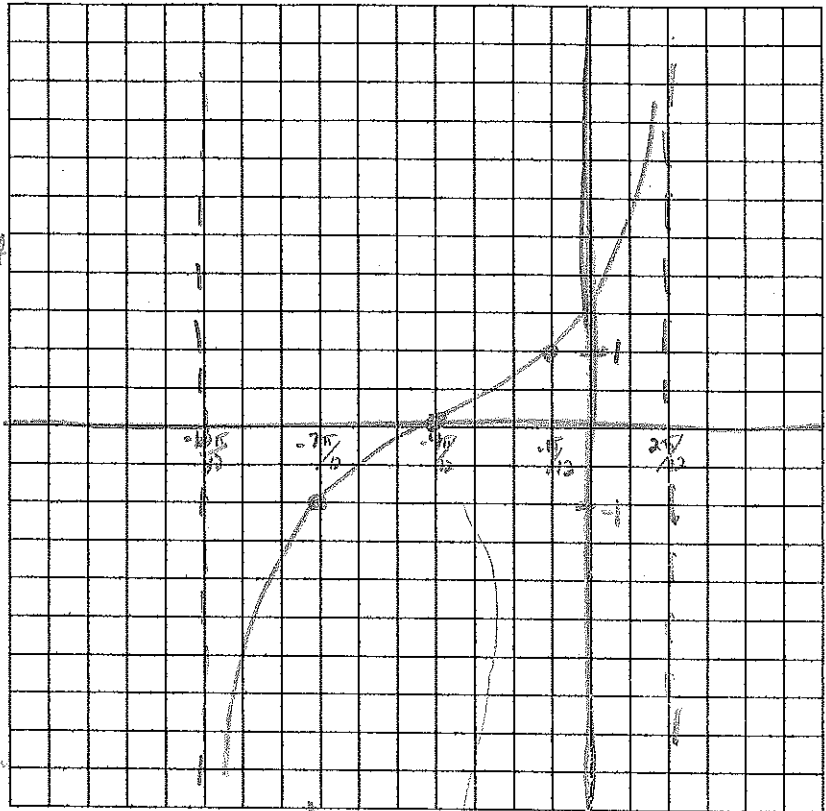
Period - π

Horizontal Trans - $\pi/3$ left

Vertical Trans - none

Key Points -

x	$-\pi/2$	$\pi/4$	0	$\pi/4$	$\pi/2$
	$-\pi/3$	$-\pi/3$	0	$\pi/3$	$\pi/3$
	$-10\pi/12$	$-8\pi/12$	$-4\pi/12$	0	$2\pi/12$
y	asym	-1	0	1	asym



2. $y = 2 \cot 3x$

Amplitude - 2

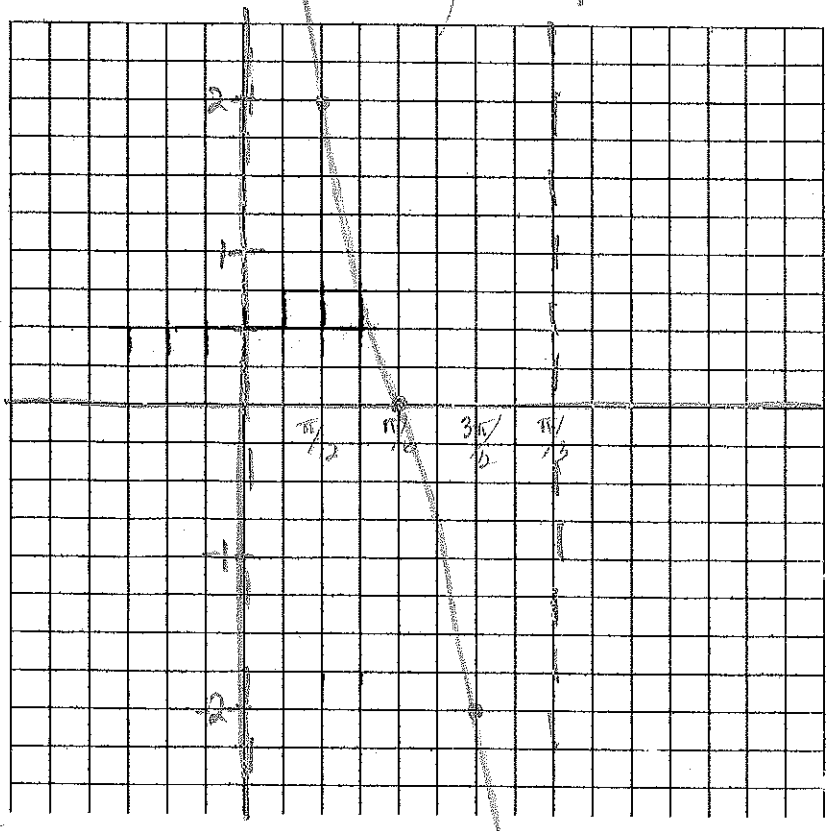
Period - $\pi \div 3 = \pi/3$

Horizontal Trans - none

Vertical Trans - none

Key Points -

x	0	$\pi/4$	$\pi/2$	$3\pi/4$	π
	$\div 3$				
	0	$\pi/12$	$\pi/6$	$3\pi/12$	$\pi/3$
y	asym	1	0	-1	asym
x	2	x 2	x 2	x 2	x 2
y	asym	2	0	-2	asym



3. $y = 2 + \cot(x - \pi/4)$

Amplitude - 1

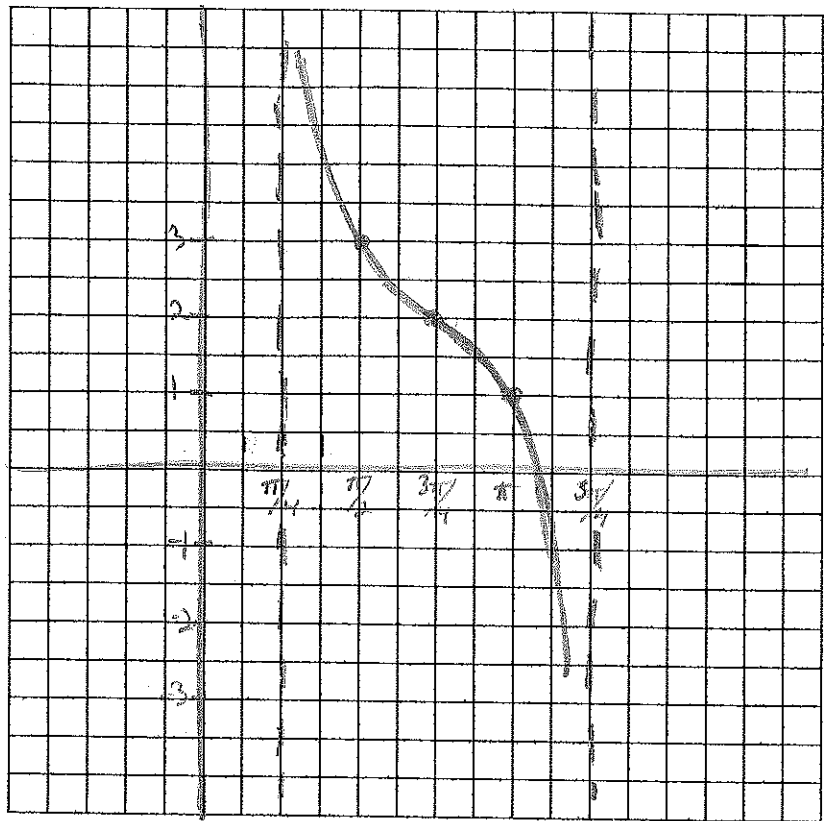
Period - π

Horizontal Trans - $\pi/4$ right

Vertical Trans - 2 up

Key Points -

x	0	$\pi/4$	$\pi/2$	$3\pi/4$	π
	$+\pi/4$	$+\pi/4$	$+\pi/4$	$+\pi/4$	$+\pi/4$
	$\pi/4$	$\pi/2$	$3\pi/4$	π	$5\pi/4$
	asym	1	0	-1	asym
		+2	+2	+2	
y		3	2	1	



4. $y = -2 + 3 \tan 1/2 x$

Amplitude - 3

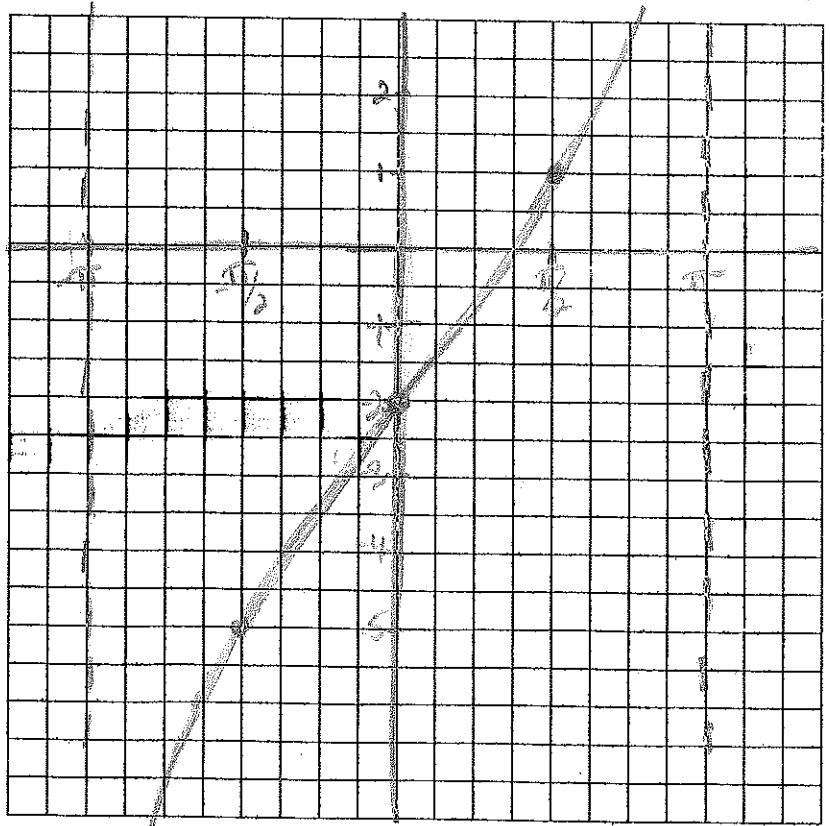
Period - $\pi \div 1/2 = 2\pi$

Horizontal Trans - none

Vertical Trans - down 2

Key Points -

x	$-\pi/2$	$-\pi/4$	0	$\pi/4$	$\pi/2$
	$\times 2$				
	$-\pi$	$-\pi/2$	0	$\pi/2$	π
	asym	-1	0	1	asym
	$\times 3$	$\times 3$	$\times 3$	$\times 3$	$\times 3$
y		-3	0	3	
		-2	-2	-2	-2
	asym	-5	-2	1	asym



5. $y = 1 - 2 \tan x$

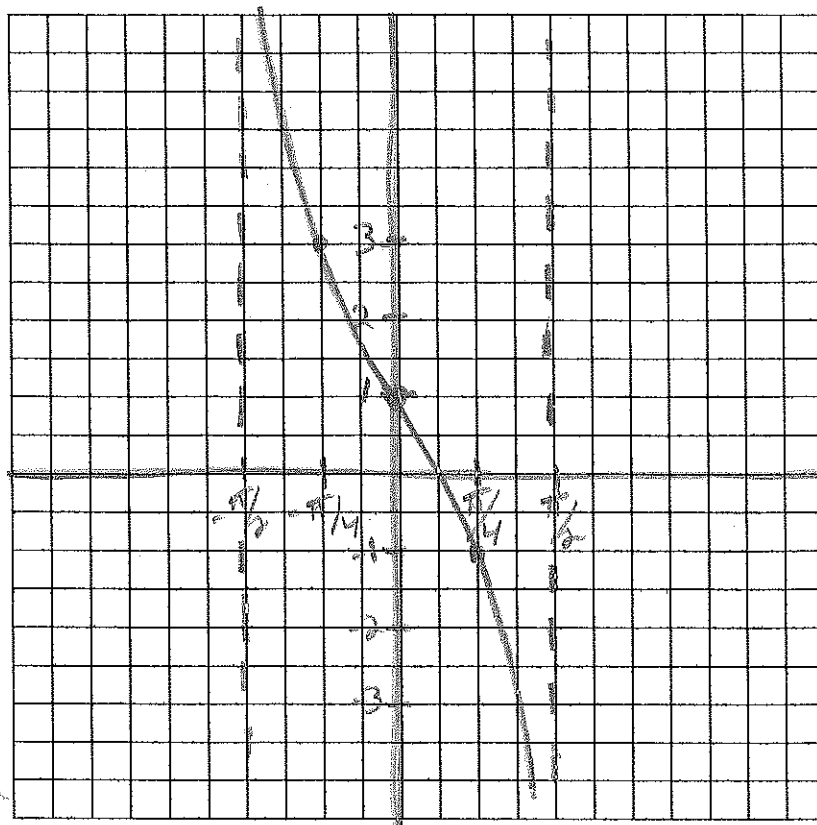
Amplitude - 2 *upside down*

Period - π

Horizontal Trans - *none*

Vertical Trans - 1 *up*

Key Points -



x	$-\frac{\pi}{2}$	$-\frac{\pi}{4}$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$
y	asym	-1	0	1	asym
		$\times 2$	$\times 2$	$\times 2$	
	asym	2	0	-2	asym
		+1	+1	+1	
	asym	3	1	-1	asym

6. $y = 2 \cot(\frac{1}{4}x - \frac{\pi}{8})$

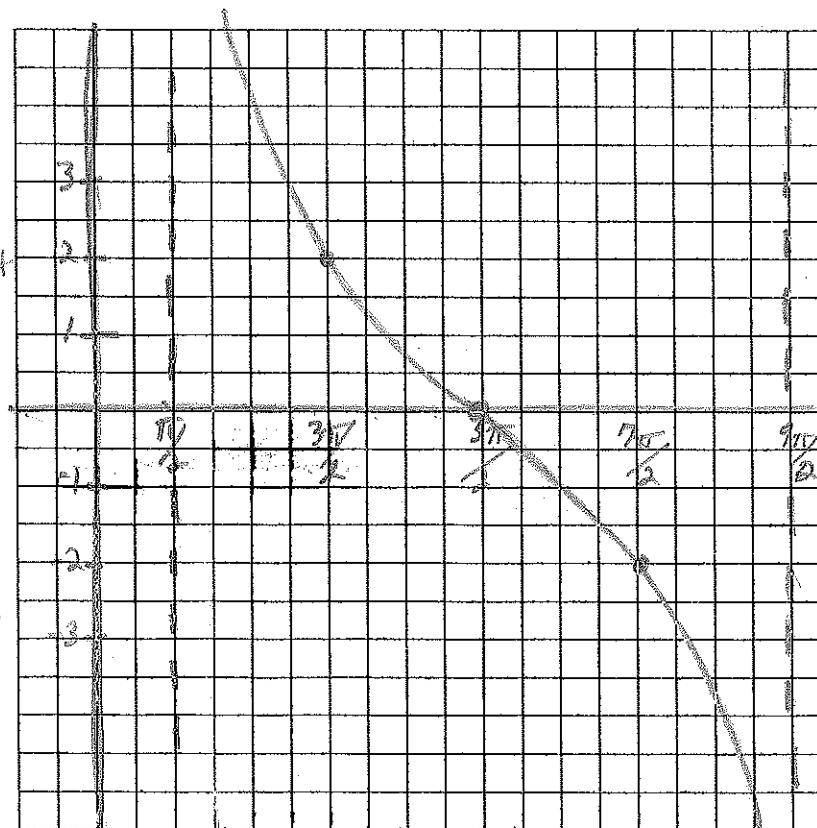
Amplitude - 2

Period - $\pi \div \frac{1}{4} = 4\pi$

Horizontal Trans - $\frac{\pi}{2}$ *right*

Vertical Trans - *none*

Key Points -



x	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{3\pi}{4}$	π
$\times 4$					
	0	π	2π	3π	4π
	$+\frac{\pi}{2}$	$+\frac{\pi}{2}$	$+\frac{\pi}{2}$	$+\frac{\pi}{2}$	$+\frac{\pi}{2}$
	$\frac{\pi}{2}$	$\frac{3\pi}{2}$	$\frac{5\pi}{2}$	$\frac{7\pi}{2}$	$\frac{9\pi}{2}$
y	asym	1	0	-1	asym
		$\times 2$	$\times 2$	$\times 2$	
	asym	2	0	-2	asym

10

11

12

13

7. Write an equation for a tangent function with a period of 2π , stretch of 2, and vertical translation of down 6. ↓

$$2\pi = \pi \div b \quad \downarrow a$$

$$b = 1/2$$

$$y = -6 + 2 \cdot \tan \frac{1}{2}x$$

8. Write an equation of a cotangent function with a period of $\frac{\pi}{2}$, horizontal translation of $\frac{\pi}{8}$ right, and vertical translation of 7 up. ↓

$$\frac{\pi}{2} = \pi \div b$$

$$b = 2$$

$$\frac{\pi}{8} = \frac{c}{b}$$

$$\frac{\pi}{8} = \frac{c}{2}$$

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

$$y = 7 + \cot(2x - \frac{\pi}{4})$$

9. Write an equation of a tangent function with a period of π , phase shift of $\frac{\pi}{2}$ to the right, a vertical translation of 2 up and a stretch of $\frac{1}{2}$. ↓

$$\pi = \pi \div b$$

$$b = 1$$

$$\frac{\pi}{2} = \frac{c}{b} = \frac{c}{1}$$

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

$$y = 2 + \frac{1}{2} \tan(x - \frac{\pi}{2})$$

10. Write an equation of a cotangent function with a period of 4π , and a vertical translation of 4 up. ↓

$$4\pi = \pi \div b$$

$$b = 1/4$$

$$y = 4 + \cot \frac{1}{4}x$$

11. Using the graph of cotangent we drew in class for what values of x does $\cot x = 0$?

$$\frac{\pi}{2} + \pi n$$

12. Using the graph of cotangent we drew in class for what values of x does $\cot x = -1$?

$$3\pi/4 + \pi n$$

13. Using the graph of tangent that we drew in class for what values of x does $\tan x = 0$?

$$\pi n$$

14. Using the graph of tangent that we drew in class for what values of x does $\tan x = 1$?

$$\pi/4 + \pi n$$

