4.6 HW

5. $y = \frac{1}{2}\tan x$

$T: (x, y) \to (x, \frac{1}{2}y)$

Period: π

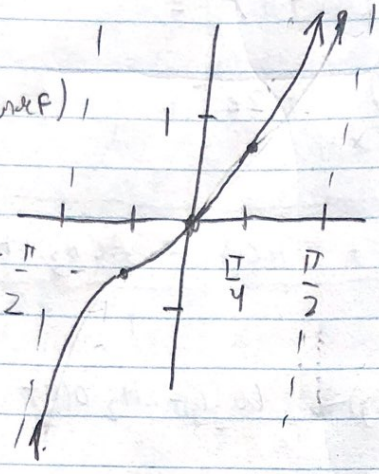
$(-\frac{\pi}{2}, \text{undef}) \to (-\frac{\pi}{2}, \text{undef})$

$(-\frac{\pi}{4}, -1) \to (-\frac{\pi}{4}, -\frac{1}{2})$

$(0, 0) \to (0, 0)$

$(\frac{\pi}{4}, 1) \to (\frac{\pi}{4}, \frac{1}{2})$

$(\frac{\pi}{2}, \text{undef}) \to \frac{\pi}{2}(\text{undef})$



Asymptotes: $x = -\frac{\pi}{2}, \frac{\pi}{2}$

9. $-\frac{1}{2}\sec x$, Asymptotes: $x = \frac{\pi}{2}, \frac{3\pi}{2}$

$y = -\frac{1}{2}\cos x$, $T: (x, y) \to (x, -\frac{1}{2}y)$

Period: 2π

Amplitude: $\frac{1}{2}$

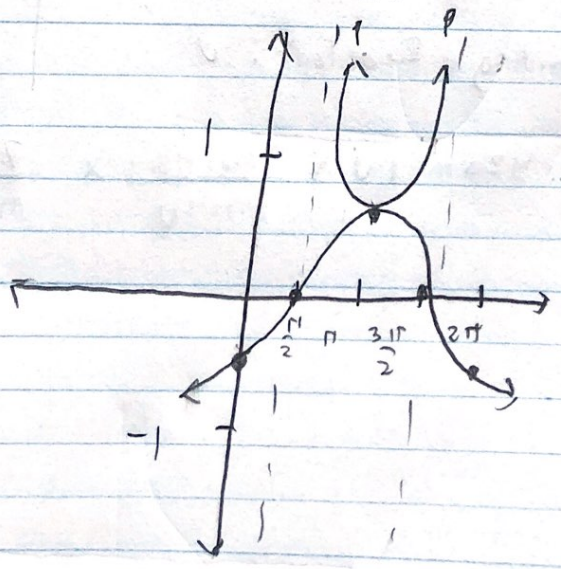
$(0, 1) \to (0, -\frac{1}{2})$

$(\frac{\pi}{2}, 0) \to (\frac{\pi}{2}, 0)$

$(\pi, -1) \to (\pi, \frac{1}{2})$

$(\frac{3\pi}{2}, 0) \to (\frac{3\pi}{2}, 0)$

$(2\pi, 1) \to (2\pi, -\frac{1}{2})$



12. $y = -2\csc 4x + 2$ Period: $\frac{\pi}{2}$ Asymptotes: $\frac{\pi}{8}, \frac{3\pi}{8}$

$T: (x, y) \to \left(\frac{1}{4}x, -2y + 2\right)$

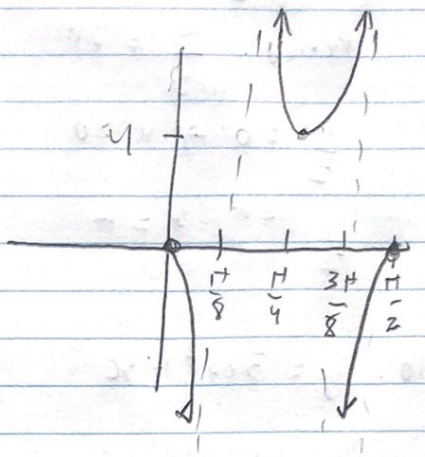
$(0, 1) \to (0, 0)$

$\left(\frac{\pi}{2}, \text{undef.}\right) \to \left(\frac{\pi}{8}, \text{undef}\right)$

$(\pi, -1) \to \left(\frac{\pi}{4}, 4\right)$

$\left(\frac{3\pi}{2}, \text{undef}\right) \to \left(\frac{3\pi}{8}, \text{undef}\right)$

$(2\pi, 1) \to \left(\frac{\pi}{2}, 0\right)$



13. $y = 3\csc \frac{x}{2}$, Asymptotes: $0, 2\pi, 4\pi$

$y = 3\sin \frac{x}{2}$ $T: (x, y) \to (2x, 3y)$

Period: $\frac{2\pi}{(1,2)} = 4\pi$ Amplitude: 3

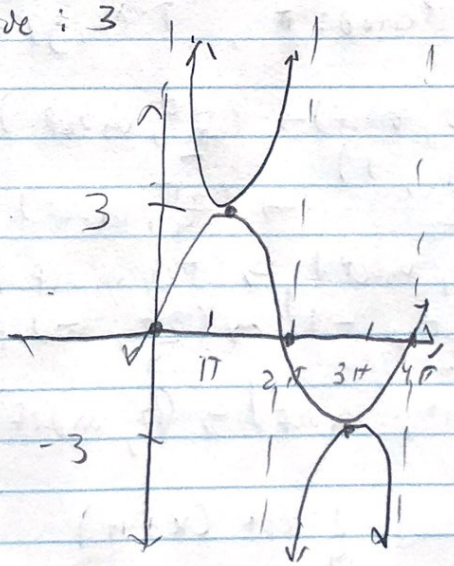
$(0, 0) \to (0, 0)$

$\left(\frac{\pi}{2}, 1\right) \to (\pi, 3)$

$(\pi, 0) \to (2\pi, 0)$

$\left(\frac{3\pi}{2}, -1\right) \to (3\pi, -3)$

$(2\pi, 0) \to (4\pi, 0)$

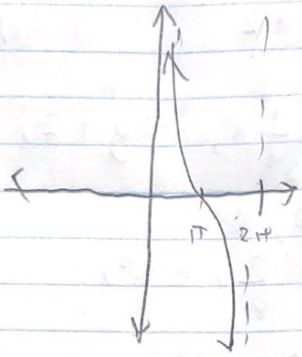


15. $y = \frac{1}{2}\cot\left(\frac{x}{2}\right)$

Period: $\frac{\pi}{(1/2)} = 2\pi$

$\frac{x}{2} = 0 \rightarrow x = 0$

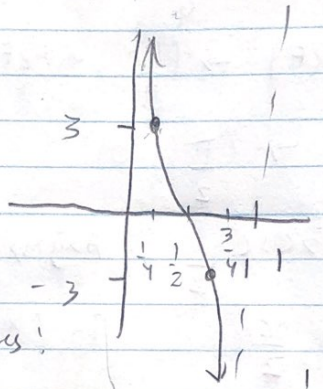
$\frac{x}{2} = \pi, \; x = \pi$



16. $y = 3\cot \pi x$

Period: 1

Asymptotes $x = 0, \; x = 1$



21. $y = \csc(2x - \pi)$, Asymptotes: $0, \pi/2, \pi$

Period: π, $T: (x, y) \rightarrow \left(x + \frac{\pi}{2}, y\right)$

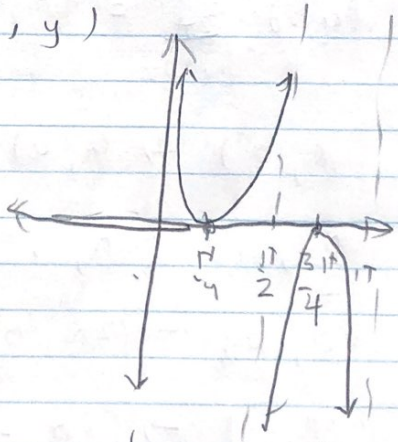
$(0, \text{undef}) \rightarrow \left(\frac{\pi}{2}, \text{undef.}\right)$

$\left(\frac{\pi}{2}, 1\right) \rightarrow \left(\frac{3\pi}{4}, 1\right)$

$(\pi, \text{undef.}) \rightarrow (\pi/2, \text{undef.})$

$\left(\frac{3\pi}{2}, -1\right) \rightarrow \left(\frac{3\pi}{4}, -1\right)$

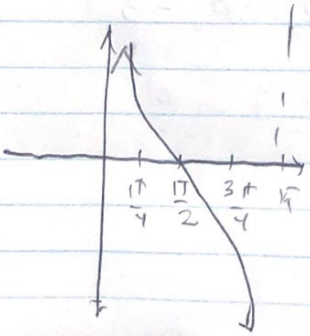
$(2\pi, \text{undef}) \rightarrow (\pi, \text{undef})$



24. $y = \frac{1}{4}\cot(x + \pi)$

Period π

Asymptotes: $0, \pi$

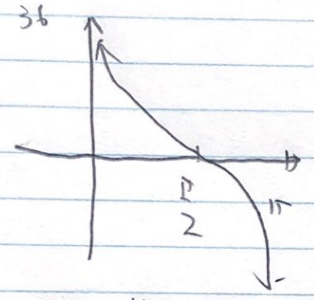


61. $\tan x = \frac{5}{d}$

$d = \frac{5}{\tan x} = 5\cot x$

$T: (x, y) \to (x, 5y)$

Window:



b. From the graph the greatest difference happens in winter

c. High and low appear at middle $\frac{11+1}{2}$
1 July