PCBCH: Mr. Jones

Solutions to problems 1, 2 [Supplemental] From HW #3

1A. Given $F(\theta) = 3\sec\left(\underbrace{2\theta - \pi/2}_{}\right) + 10$

Call entire angle "A"

places $\cos(A) = 0$

Domain: All θ such that $\cos(A) \neq 0$

$\rightarrow A \neq \pi/2 + \pi n$ where $n \in \mathbb{Z}$

$\rightarrow 2\theta - \pi/2 \neq \pi/2 + \pi n$ where $n \in \mathbb{Z}$

$\rightarrow 2\theta \neq \pi + \pi n$ where $n \in \mathbb{Z}$

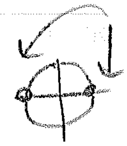
$\rightarrow \theta \neq \pi/2 + \frac{\pi}{2} n$ where $n \in \mathbb{Z}$

This is an ok Final answer, but it can simplify to $\theta \neq \left(\frac{\pi}{2}\right) n$ where $n \in \mathbb{Z}$

Range: we play off of our mid-height $= 10$ and our associated cosine amp $= 3$

$\rightarrow$ Range: $(-\infty, 7] \cup [13, +\infty)$

B. Given: $g(\theta) = 2\cot\left(\underbrace{\theta + \pi/2}_{}\right)$ Call entire Angle "A")



places $\sin(A) = 0$

Domain: All θ such that $\sin(A) \neq 0$

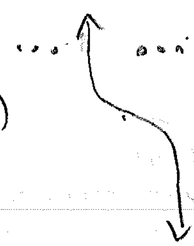
$\rightarrow A \neq \pi n$ where $n \in \mathbb{Z}$

$\rightarrow \theta + \pi/2 \neq \pi n$ where $n \in \mathbb{Z}$

$\rightarrow \theta \neq -\pi/2 + \pi n$ where $n \in \mathbb{Z}$ (or some equivalent)

Range: All reals or $(-\infty, \infty)$

$\leftarrow$ cot shape reaches all heights



2. Sketch one period of $f(\theta) = 5\csc[4(\theta-\pi)] + 7$

We will graph the "reference" curve $p(\theta) = 5\sin(4(\theta-\pi)) + 7$ and then "play" off of it [Maxes become mins, etc...]

$p(\theta) = 5\sin[4(\theta-\pi)] + 7$

$b = 4 \to p = \frac{2\pi}{4} = \frac{\pi}{2} \to \frac{1}{4}p = \pi/8$ ← good choice of horiz axis tick mark spacing

The positional shift is π right, 7 up → we can "re-orient" to $(\pi, 7)$ and pretend $(\pi, 7)$ is our new origin

amp = 5