1. In a device, a drum is used to retract a 2 ft string in 0.05 second. At least how big the radius of the drum needs to be if the average spinning speed is 20 rps?
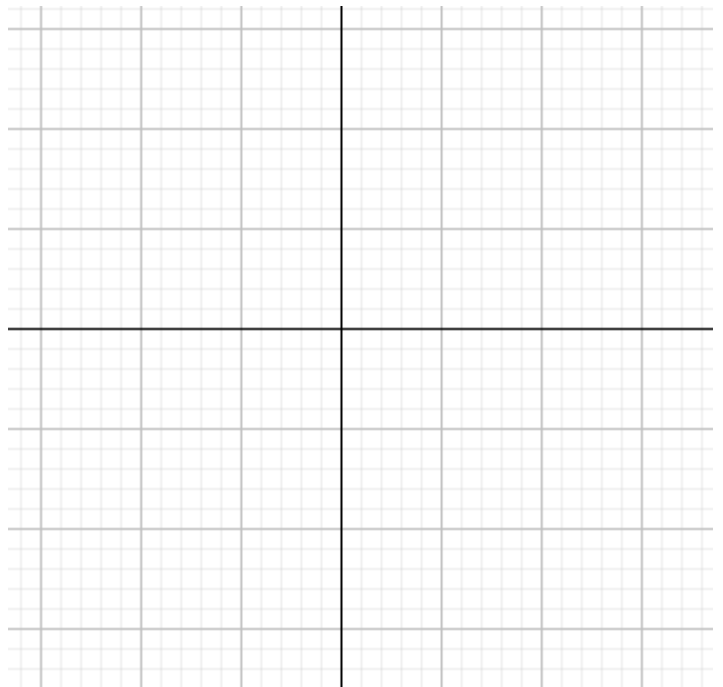
2. Verify $\sec\theta - \tan\theta\sin\theta = \dfrac{1}{\sec\theta}$

3. Given $f(x) = \dfrac{3}{2}\sin(\dfrac{\pi}{2}x - \pi) - \dfrac{3}{4}$,

(a) Graph the function for at least 2 whole periods.
(b) Find x-intercepts .
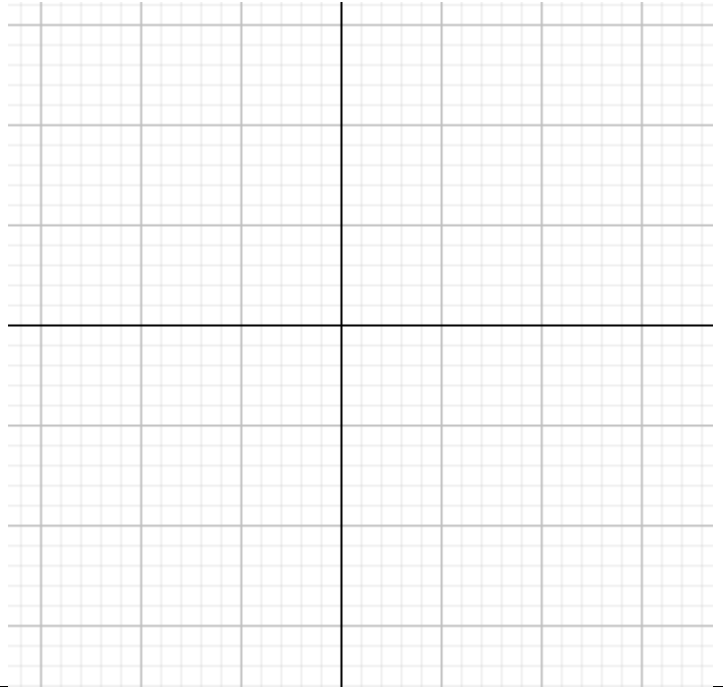(c) Identify and write the range of $f(x)$ using interval notation.

4. Given $f(x) = -\pi \cot(\pi x - \pi) + \pi$

(a) Graph at least 2 whole periods for $x > 0$
(b) Find x-intercepts.
(c) Find vertical asymptotes.

5. Let $\dfrac{\pi}{2} \le \theta < \dfrac{3\pi}{2}$, $4\sin^2\theta - 4\sin\theta - 3 = 0$, find

$\tan\theta + \cot\theta$

6 If the terminal side of θ is in the 4th quadrant and
$\csc\theta = -4$, find $\sec(\pi + \theta)$