FOR MAXIMUM SPEED

$$2r\sin\tfrac{\theta}{2} = d$$
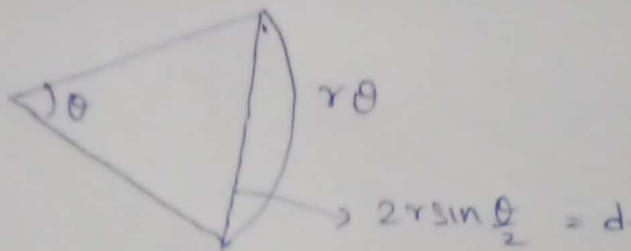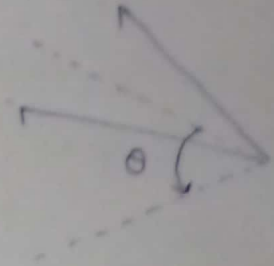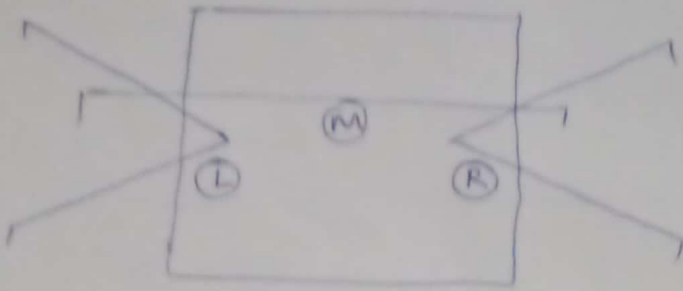
$$t_1 = \theta/\omega$$

time for middle servo to switch sides $= \dfrac{\phi}{\omega}$

($\phi \to$ angle swept by middle servo)

$$\therefore \quad V = \frac{2r\sin\tfrac{\theta}{2}}{\tfrac{\theta}{\omega} + \tfrac{\phi}{\omega}} = 2r\omega\left(\frac{\sin\tfrac{\theta}{2}}{\theta + \phi}\right)$$

Assuming $\phi = 30°$:

$$V = 2r\omega\left(\frac{\sin\theta/2}{\theta + \pi/6}\right)$$

max value at $\theta = \underline{94.94°}$ (using DESMOS)

FOR MAXIMUM EFFICIENCY:

For max efficiency:

$$\frac{\text{distance moved by bot}}{\text{total angle swept by all servos}} \quad \text{should be max}$$

$$= \frac{2r \sin \frac{\theta}{2}}{2\theta + \phi}$$

Assuming $\Rightarrow \phi = \pi/6$

$$\frac{2r \sin \theta/2}{2\theta + \pi/6} = 2r \left(\frac{\sin \theta/2}{2\theta + \pi/6} \right)$$

has max value at $\theta = 78.32°$

(using DESMOS)

$\therefore$
FOR MAX SPEED : $\theta = 94.94°$
FOR MAX EFFICIENCY : $\theta = 78.32°$