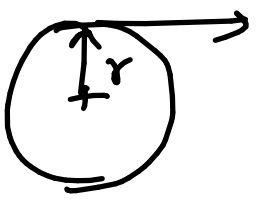
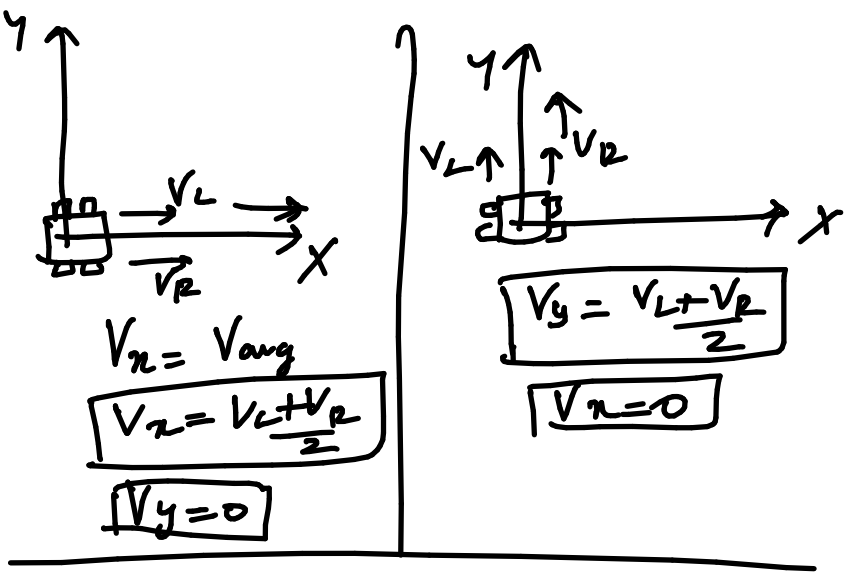


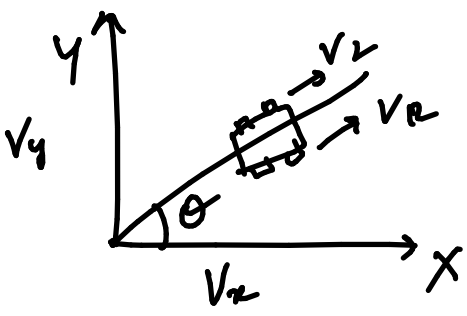
$V = r\omega$

$V \rightarrow$ Linear velocity

$r \rightarrow$ Radius of wheel

$\omega \rightarrow$ Angular velocity

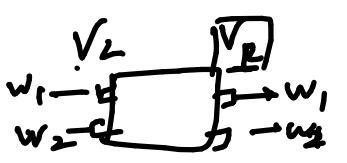




Resolving

$V_x = V_{avg}\cos\theta$

$V_y = V_{avg}\sin\theta$



$V_L = R(\omega_{L1} + \omega_{L2})$

$V_R = R(\omega_{R1} + \omega_{R2})$

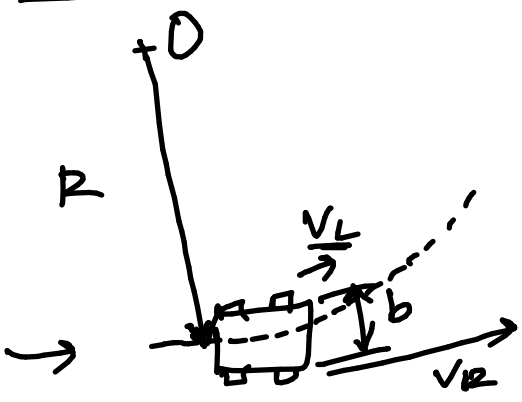
$V_{avg} = \frac{V_L + V_R}{2}$

Angular velocity

O → Instantaneous centre

R → Radius of curvature

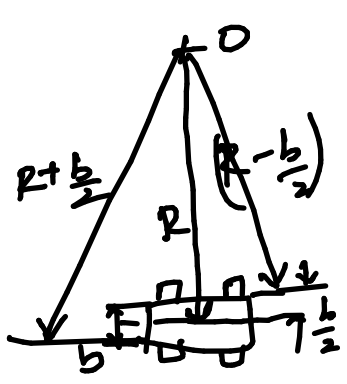
b → track width



$V_L = \omega(\text{Radius})$

① $V_L = \omega\left(R - \frac{b}{2}\right)$

② $V_R = \omega\left(R + \frac{b}{2}\right)$



$\frac{V_L}{\omega} = R - \frac{b}{2}$

$\frac{V_L}{\omega} + \frac{b}{2} = R$ — ③

sub ③ in ②

$V_R = \omega\left(\frac{V_L}{\omega} + \frac{b}{2} + \frac{b}{2}\right)$

$\frac{V_R}{\omega} = \omega\left(\frac{V_L}{\omega} + b\right)$

$\frac{V_R}{\omega} - \frac{V_L}{\omega} = b$

$\frac{V_R - V_L}{b} = \omega$

$\omega \propto$ diff of velocity

$\omega \propto \frac{1}{\text{track width}}$

$V_x \curvearrowright \rightarrow x_{pos}$

$V_y \nearrow \rightarrow y_{pos}$

$\omega \curvearrowright \rightarrow \theta$

$V_x = \frac{dx}{dt}$

$\int dx = \int V_x dt$

$x = \int V_x dt$

$x = \int V_{avg}\cos\theta\, dt$

$V_y = \frac{dy}{dt}$

$\int dy = \int V_y dt$

$y = \int V_y dt$

$y = \int V_{avg}\sin\theta\, dt$

$\omega = \frac{d\theta}{dt}$

$\int d\theta = \int \omega . dt$

$\theta = \int \omega\, dt$