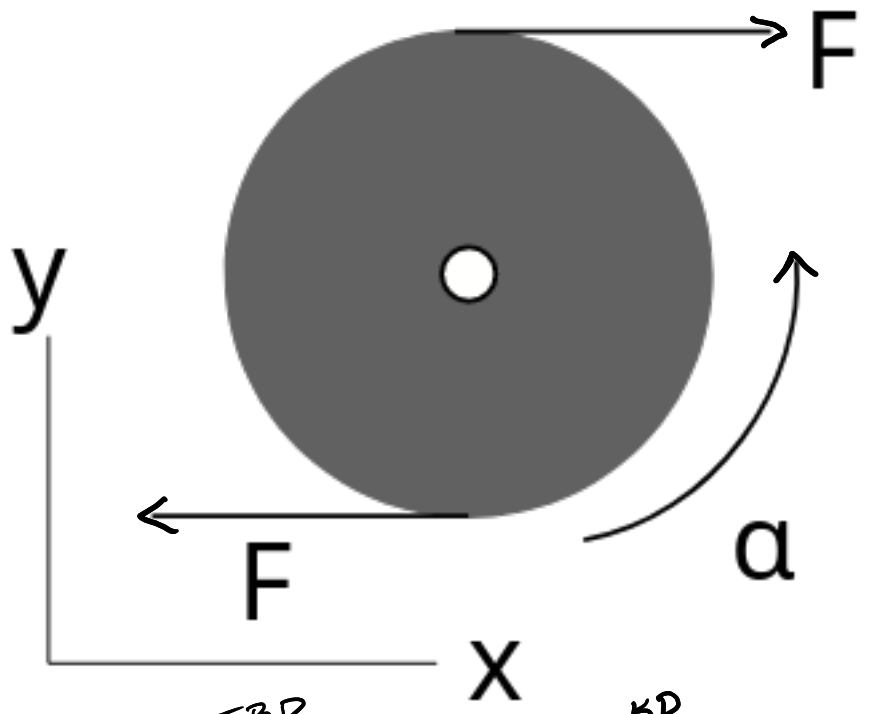


FBD = KD

$\tau = \sum \bar{M} = \bar{r} \times \sum F = \bar{r} \times m\bar{a}$

$\Rightarrow I\alpha$

$\bar{r}_1 = r\hat{j}$

$\bar{r}_2 = -r\hat{j}$

$\sum M = -2Fr = I\alpha$

$r\hat{j} \times F\hat{i} + r\hat{j} \times -F\hat{i} = I\alpha$

$-2rF\hat{k} = I\alpha$

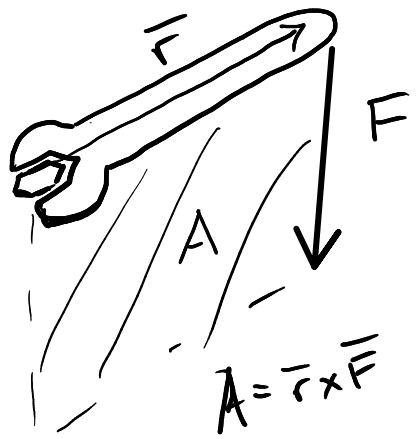
$F = \frac{I\alpha}{2r}$

note

$\bar{r} \times \bar{T} = 0$

$\bar{r} \times \frac{mv^2}{R} e_r = 0$

$\bar{r} \times \bar{F} = \bar{M}$



$\bar{r} = 2\hat{i} + 1\hat{j}$ (m)

$\bar{F} = -4\hat{j}$ (N)

$\bar{r} \times \bar{F} = (2\hat{i} + 1\hat{j}) \times (-4\hat{j})$

$-8\hat{k}$ Nm

note

realistic start needs pin constraints

$=$ $\circlearrowright I\alpha$