TYPES OF ACCELERATION IN ROTATION

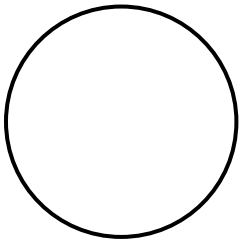
- There are FOUR types of acceleration in rotation problems →

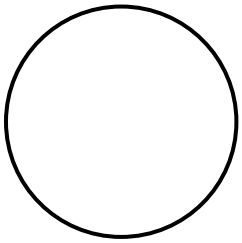
- Centripetal / Radial	(linear)	_____
- Tangential	(linear)	_____
- Total / Acceleration	(linear)	_____
- Rotational / Angular		_____

- BUT some exist only if you're accelerating (spinning faster):

- You always have $\mathbf{v}_T$, $\mathbf{a}_C$ (aka $\mathbf{a}_{RAD}$), and **w**:

- IF accelerating: you also have $\mathbf{a}_T$ and **α**:





- $\mathbf{a}_C$ _____.

- $\mathbf{a}_T$ (and **α**) _____.

- The equation $\mathbf{a}_T = \mathbf{r}\,\alpha$ is a way to remember that $\mathbf{a}_T$ and **α** are connected. If one is zero, the other has to be zero.

- Note that IF $\mathbf{a}_T = \mathbf{0}$, then **a** = _____ becomes **a** = _____ = $\mathbf{a}_C$.

EXAMPLE 1: A carousel 10 m in radius completes one cycle every 45 s. A boy stands at the edge of the carousel. Find his:

(a) Tangential velocity
(b) Angular acceleration
(c) Radial acceleration
(d) Tangential acceleration
(e) Total linear acceleration

EXAMPLE 2: A carousel 16 m in radius accelerates from rest with 0.05 rad/s². A boy stands at the edge of the carousel. After the carousel has accelerated for 10 s, calculate the boy's:

(a) Tangential velocity
(b) Tangential acceleration
(c) Radial acceleration
(d) Angular acceleration
(e) Total linear acceleration

PRACTICE: ROTATIONAL KINEMATICS

PRACTICE**:** A large disc of radius 10 m initially at rest takes 200 full revolutions to reach 30 RPM. Calculate the total linear acceleration of a point at half way between the disc's center and its edge, once the disc reaches 30 RPM.
(You may assume it continues accelerating past that point)

PRACTICE: ROTATIONAL KINEMATICS

PRACTICE**:** An object of negligible size moves in a circular path of radius 20 m with 90 RPM. Find its radial acceleration**.**