5) Think about linear kinematics. Is it possible for \( x=0 \) but \( \dot{x} \neq 0 \)?

Of course it is!

Same thing for rotational kinematics.

\[ \theta = 0, \text{ slope} \neq 0 \]

6) Again, think about linear kinematics.

\[ \dot{v}_x = 0, \text{ slope} \neq 0 \]

Ditto for rotational kinematics. So yes!

7) Consider a bike wheel freely spinning. (It's axle is mounted & fixed in place) Any friction in the bearing will slow the wheel down, meaning that \( \ddot{\alpha} \) points opposite to \( \vec{\omega} \).