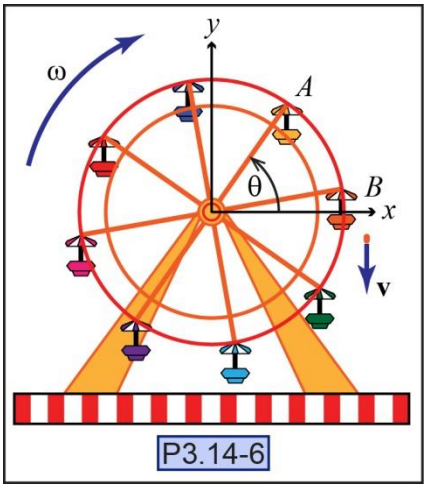
3.14-6) Consider the Ferris wheel as shown with a radius of 10 meters. At this instant, a little girl in Car *B* drops her toy out of her car and, due to air resistance, it falls straight down with an acceleration of 5 m/s^2. If $\theta = 45^o$, $\dot{\theta} = -0.5$ rad/sec and $\ddot{\theta} = 0.05$ rad/sec^2, what acceleration does the toy appear to have to the passengers in Car *A*? You may assume that Car *A* is a particle concentrated at the point where it is attached to the Ferris wheel



Given:

Find:

Solution:

Coordinate system

Which coordinate system should be used to solve for the acceleration of car *A*? Circle the correct answer.

n-t *r-θ*

Draw a coordinate system for car *A* on the figure.

Acceleration

Write down the acceleration of the toy.

$\mathbf{a}_{toy}$ = _____ **i** + _____ **j**

Calculate the acceleration of car *A* using the coordinate system choosen above.

$\mathbf{a}_A$ = _____

Transform the acceleration of car A into the *x-y* coordinate system.

$\mathbf{a}_A$ = _____ **i** + _____ **j**

Relative Acceleration

Calculate the acceleration of the toy relative to car *A*.

$\mathbf{a}_{toy/A}$= _____