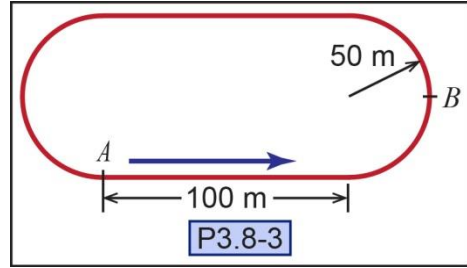


P3.8-3) Consider the racing oval shown. A car begins from rest at point *A* and increases its speed at a rate of $\dot{v} = 0.2t$ m/s², where *t* is in seconds. Determine (a) the time it takes the car to reach the apex of the curve at point *B* and (b) the racecar's velocity and total acceleration as it passes point *B*.



Given:

Find:

Solution:

Velocity.

Is $\dot{v} = 0.2t$ the tangential acceleration or the normal acceleration?

Tangential Normal

Derive the car velocity as a function of time.

$v =$ _____

Position

Derive the car's distance traveled (*s*-coordinate position) as a function of time.

$s =$ _____

What is the total distance traveled by the car?

$s_{total} =$ _____

Calculate the time of the car.

$t_{total} =$ _____

Acceleration

Calculate the total acceleration of the car as it passes point *B*.

$\mathbf{a} =$ _____