

P3.8-1) A man drives a car on a 100-m radius circular horizontal test track. The driver starts the car from rest and increases its speed at a uniform rate for 20 seconds until the car reaches a speed of 36 m/s. Determine the magnitude of the total acceleration of the car 10 seconds after the driver starts accelerating the car.

Given:

Find:

Solution:

Determine the car's total acceleration.

Write down the acceleration equation in terms of n - t coordinates.

$\mathbf{a} =$ _____

What is the radius of curvature?

$\rho =$ _____

What is the car's initial speed?

$v_o =$ _____

What is the car's final speed?

$v_f =$ _____

Calculate the car's tangential acceleration.

$a_t = \dot{v} =$ _____

What is the car's speed at 10 seconds?

$v_{t=10} =$ _____

What is the car's total acceleration?

$\mathbf{a} =$ _____

What is the magnitude of the car's total acceleration?

$a =$ _____