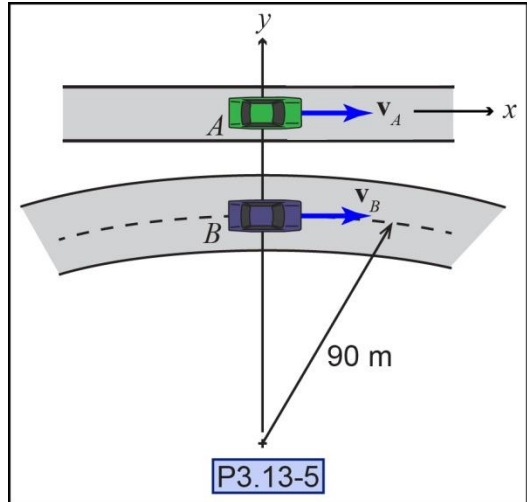


P3.13-5)^{fe} The driver of car *A* is traveling along a straight road with a speed of 15 m/s while accelerating at 1 m/s² when he notices car *B* directly to his right as shown. If at this instant car *B* is traveling around a 90-m curve with a speed of 5 m/s while slowing down at a rate 1 m/s², what acceleration does car *B* appear to have to the driver of car *A*?



Given:

Find:

Solution:

Velocity

Write down the velocity of Car *A* and Car *B*.

$\mathbf{v}_A = \text{_____ } \mathbf{i} + \text{_____ } \mathbf{j}$

$\mathbf{v}_B = \text{_____ } \mathbf{i} + \text{_____ } \mathbf{j}$

What is the velocity of Car *B* relative to Car *A*?

$\mathbf{v}_{B/A} = \text{_____ } \mathbf{i} + \text{_____ } \mathbf{j}$

Remember units!

Acceleration

Write down the acceleration of car *A*.

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

Determine the acceleration of car *B* in *n-t* coordinates.

$\mathbf{a}_B = \text{_____ } \mathbf{e}_t + \text{_____ } \mathbf{e}_n$

$\mathbf{a}_B = \text{_____ } \mathbf{i} + \text{_____ } \mathbf{j}$

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

$\mathbf{a}_{B/A} = \text{_____ } \mathbf{i} + \text{_____ } \mathbf{j}$