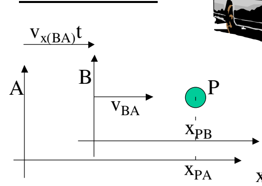
Problems Class 1

- If **a** = (1,2,3) and **b** = (3,0,-1) determine:
  - The magnitudes of **a** and **b**.
  - The sum of **a** and **b**.
  - The vector given by 2**a** - 3**b**.
  - The scalar product of **a** and **b**.
  - The vector product of **a** and **b**.
- What is the angle between vectors **a** and **b**?

Problems Class 1

- A coach is passing a football field at a speed of 30mph. One of the footballers kicks the ball along the ground at an angle of 90° to the road and a speed of 10ms^{-1}. From the perspective of the coaches passengers, what angle does the path of the football make with respect to the road if the ball is travelling away from the road?

<u>Relative Motion</u>



$$x_{(PB)} = x_{(PA)} - v_{x(BA)}t$$

$$\Rightarrow v_{x(PB)} = v_{x(PA)} - v_{x(BA)}$$

Problems Class 1

- The driver of a low slung racing car (low centre of gravity, assume c. of g. at road level) wishes to stop the car in as short a distance as possible. Should she brake so that the wheels lock, or so that they just continue rotating? If $\mu_k = 0.6$ and $\mu_s = 0.7$ between the tyres and the road, what is the difference in stopping distance from 130mph in the two cases?