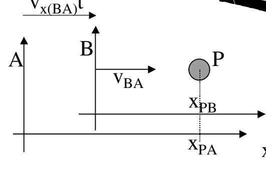
Problems Class 1

- 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?

Relative Motion



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

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

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?