**8B Projectiles with Vectors**

1. A ball is struck by a racket from a point $A$ which has position vector $20j m$ relative to a fixed origin O. Immediately after being struck, the ball has velocity $\left(5i+8j\right) ms^{-1}$, where $i$ and $j$ are unit vectors horizontally and vertically respectively. After being struck, the ball travels freely under gravity until it strikes the ground at point $B$.
2. Find the speed of the ball 1.5 seconds after being struck
3. Find an expression for the position vector, $r$ of the ball relative to $O$ at time $t$ seconds
4. Hence determine the distance $OB$