8B Projectiles with Vectors

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

b) Find an expression for the position vector, $\boldsymbol{r}$ of the ball relative to O at time t seconds

c) Hence determine the distance OB