Quiz 4

The following information may or may not be of use:

$$m_{\text{electron}} = 9.1 \times 10^{-31} \text{ kg}$$
$$e = 1.6 \times 10^{-19} \text{ C}$$
$$\varepsilon_0 = 8.85 \times 10^{-12} \text{C}^2 \text{ N}^{-1} \text{ m}^{-2}$$
$$k = \frac{1}{4\pi\varepsilon_0} = 9 \times 10^9 \text{N m}^2 \text{ C}^{-2}$$
$$\Delta V = -\vec{E} \cdot \Delta\vec{r}$$
$$\Delta U = q\Delta V$$
$$V_{pt} = \frac{1}{4\pi\epsilon_0}\frac{q}{r}$$

In a region of space there is a uniform electric field $\vec{E} =< -100, 400, 0 >$ $\frac{\text{N}}{\text{C}}$. Point A is located at $\vec{r_A} =< 0, 3, 0 >$ m, and point B is located at $\vec{r_B} =< 5, 1, 0 >$ m.

An electron starts from rest at point A and moves to point B. What is the electron's speed at point B?