

Question #141**Answer: E**

$$E[Z] = b\bar{A}_x$$

since constant force $\bar{A}_x = \mu/(\mu + \delta)$

$$E(Z) = \frac{b\mu}{\mu + \delta} = \frac{b(0.02)}{(0.06)} = b/3$$

$$\begin{aligned}\text{Var}[Z] &= \text{Var}[bv^T] = b^2\text{Var}[v^T] = b^2(\bar{A}_x^2 - \bar{A}_x^2) \\ &= b^2\left(\frac{\mu}{\mu + 2\delta} - \left(\frac{\mu}{\mu + \delta}\right)^2\right) \\ &= b^2\left[\frac{2}{10} - \frac{1}{9}\right] = b^2\left(\frac{4}{45}\right)\end{aligned}$$

$$\text{Var}(Z) = E(Z)$$

$$b^2\left[\frac{4}{45}\right] = \frac{b}{3}$$

$$b\left[\frac{4}{45}\right] = \frac{1}{3} \Rightarrow b = 3.75$$