

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

$$\text{Var}(Z) = {}^2A_x - (A_x)^2$$

(41)

$$A_{41} - A_{40} = .00822$$

$$\hookrightarrow \underline{A_{40} = A_{41} - .00822}$$

$${}^2A_{41} - {}^2A_{40} = .00433$$

$$\hookrightarrow \underline{{}^2A_{40} = {}^2A_{41} - .00433}$$

$$A_{40} = v P_{40} A_{41} + v q_{40}$$

$$A_{41} - .00822 = \left(\frac{1}{1.05}\right)(.9972)A_{41} + \left(\frac{1}{1.05}\right)(.0028)$$

$$.05028 A_{41} = .010867 \rightarrow A_{41} = .2161$$

$${}^2A_{40} = v^2 P_{40} {}^2A_{41} + v^2 q_{40}$$

$${}^2A_{41} - .00433 = \left(\frac{1}{1.05}\right)^2 (.9972)^2 A_{41} + \left(\frac{1}{1.05}\right)^2 (.0028)$$

$$.09551 {}^2A_{41} = .00684 \rightarrow {}^2A_{41} = .07161$$

$$\text{Var}(Z) = .07161 - (.2161)^2 = .0249 \quad \boxed{C}$$

$$i = 5\% \rightarrow v = \frac{1}{1.05}$$

$$P_{40} = .9972 \rightarrow q_{40} = .0028$$

$$A_{41} =$$

$${}^2A_{41} =$$