

Question #281

Key: B

Let $R =$ Equity index return. $R \sim N(\mu = 8\%, \sigma = 16\%)$

$X = 0.75 R$ $X \sim N(\mu = 6\%, \sigma = 12\%)$

$Y =$ crediting rate $= \text{Max}(R, 3\%)$

$$Y = X + 3\% - (X \wedge 3\%)$$

(If $X < 3\%$, $X \wedge 3\% = X$ and $Y = X + 3\% - X = 3\%$)

(If $X > 3\%$ $X \wedge 3\% = 3\%$ and $Y = X + 3\% - 3\% = X$)

$$E(Y) = E(X + 3\% - (X \wedge 3\%))$$

$$= E(X) + 3\% - E(X \wedge 3\%)$$

$$= 6\% + 3\% - (-0.43\%)$$

$$= 9.43\%$$

Note that $E(X \wedge 3\%)$ is a table lookup in the given information.