

Answer on Question #48470 – Math – Statistics and Probability

A certain bond fund over the last 12 years has had a mean yearly return of $\mu = 5.9\%$ with a standard deviation of $\sigma = 1.8\%$.

A. If you had invested in this fund over the past 12 years, in how many of these years would you expect to have learned at least 8% on your investment?

B. In how many years would you expect to have earned less than 4%?

Solution

A. The ratio of years in which I learned at least 8% on your investment is

$$P(X > 8\%) = P\left(z > \frac{8\% - 5.9\%}{1.8\%}\right) = P(z > 1.17) = 1 - P(z < 1.17).$$

From z-table we know:

$$P(z < 1.17) = 0.8790.$$

That's why

$$P(X > 8\%) = 1 - 0.8790 = 0.121.$$

The number of years in which I learned at least 8% on your investment is

$$12 \cdot 0.121 = 1.45.$$

B. The ratio of years in which I expect to have earned less than 4% is

$$P(X < 4\%) = P\left(z < \frac{4\% - 5.9\%}{1.8\%}\right) = P(z < -1.06).$$

From z-table we know:

$$P(z < -1.06) = 0.1446.$$

The number of years in which I expect to have earned less than 4% is

$$12 \cdot 0.1446 = 1.74.$$