

3. The distribution of the returns on common stocks is roughly symmetric but extreme observations are more frequent than in a normal distribution. Because the distribution is not strongly non-normal, the average return over even a moderate number of years is close to normal; in the long run, annual real returns on common stocks have varied with an average of about 9% and standard deviation about 28%. Judy plans to retire in 45 years, and is considering investing in stocks.

**MARKS**

8  
(2, 5)

- (a) Name the theorem that provides the basis for assuming approximate normality of the distribution of the average annual return on common stocks; also indicate briefly the factor(s) which influence how accurate the approximation will be.
- (b) Assuming that the past pattern of variation continues, find the approximate probability that the average annual return on common stocks over the next 45 years will exceed 15%.

(a)

(b)

