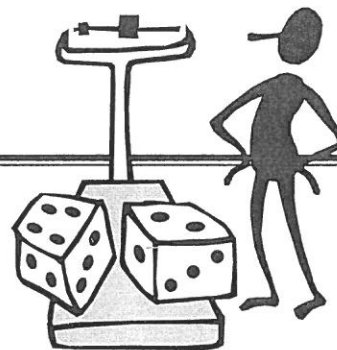


## Chapter 16: Random Variables



### Key Vocabulary:

- random variable
- discrete random variable
- continuous random variable
- standard deviation
- expected value
- $E(X)$
- $V(X)$

### Calculator Skills:

- 1-VarStats  $L_1, L_2$

1. What is meant by a random variable?
2. Explain the difference between a discrete random variable and a continuous random variable.
3. What information does a probability model give?
4. What is the expected value of a random variable?
5. How do you calculate the expected value of a random variable?
6. Explain the difference between the notations  $\bar{x}$  and  $\mu_x$ .
7. Suppose  $\mu_x = 5$  and  $\mu_y = 10$ . According to the rules for means, what is  $\mu_{x+y}$ ?
8. Suppose  $\mu_x = 2$ . According to the rules for means, what is  $\mu_{3+4x}$ ?

9. Explain how to calculate the variance of a discrete random variable  $X$  using the formula

$$\sigma_X^2 = \sum (x_i - \mu_X)^2 p_i$$

10. Given the variance of a random variable, explain how to calculate the standard deviation.

11. Suppose  $\sigma_X^2 = 2$  and  $\sigma_Y^2 = 3$  and  $X$  and  $Y$  are independent random variables. According to the rules for variances, what is  $\sigma_{X+Y}^2$ ? What is  $\sigma_{X+Y}$ ?

12. Suppose  $\sigma_X^2 = 4$ . According to the rules for variances, what is  $\sigma_{3+2X}^2$ ? What is  $\sigma_{3+2X}$ ?

