

ICM 3.2 Exercises

- During the first year at a university that uses a four-point grading system, a freshman took ten three-credit courses and received two As, three Bs, four Cs, and one D.
 - Compute this student's grade-point average.
 - Let the random variable X denote the number of points corresponding to a given letter grade. Find the probability distribution of the random variable X and compute $E(X)$, the expected value of X .
- In a four-child family, what is the expected number of boys? (Assume that the probability of a boy being born is the same as the probability of a girl being born.)
- EXPECTED SALES** On the basis of past experience, the manager of the VideoRama Store has compiled the following table, which gives the probabilities that a customer who enters the VideoRama Store will buy 0, 1, 2, 3, or 4 DVDs. How many DVDs can a customer entering this store be expected to buy?

DVDs	0	1	2	3	4
Probability	.42	.36	.14	.05	.03
- If a sample of three batteries is selected from a lot of ten, of which two are defective, what is the expected number of defective batteries?
- LOTTERIES** In a lottery, 5000 tickets are sold for \$1 each. One first prize of \$2000, 1 second prize of \$500, 3 third prizes of \$100, and 10 consolation prizes of \$25 are to be awarded. What are the expected net earnings of a person who buys one ticket?
- LIFE INSURANCE PREMIUMS** A woman purchased a \$20,000, 1-year term-life insurance policy for \$260. Assuming that the probability that she will live another year is .992, find the company's expected gain.

7. **INVESTMENT ANALYSIS** The proprietor of Midland Construction Company has to decide between two projects. He estimates that the first project will yield a profit of \$180,000 with a probability of .7 or a profit of \$150,000 with a probability of .3; the second project will yield a profit of \$220,000 with a probability of .6 or a profit of \$80,000 with a probability of .4. Which project should the proprietor choose if he wants to maximize his expected profit?
-
30. The probability of an event E occurring is .8. What are the odds in favor of E occurring? What are the odds against E occurring?
31. The probability of an event E not occurring is .6. What are the odds in favor of E occurring? What are the odds against E occurring?
32. The odds in favor of an event E occurring are 9 to 7. What is the probability of E occurring?
33. The odds against an event E occurring are 2 to 3. What is the probability of E not occurring?
34. **ODDS OF MAKING A SALE** Carmen, a computer sales representative, believes that the odds are 8 to 5 that she will clinch the sale of a minicomputer to a certain company. What is the (subjective) probability that Carmen will make the sale?
35. **SPORTS** Steffi believes that the odds in favor of her winning her tennis match tomorrow are 7 to 5. What is the (subjective) probability that she will win her match tomorrow?