

1.

In a programmed learning module, if a student answers a question correctly, she proceeds to the next question; otherwise, more study is required. Question 1 is a multiple-choice question with **six** possible responses, and question 2 is a multiple-choice question with **three** possible responses. There is one correct response to each question. A student has not studied but tries to proceed through the questions by guessing. Find the probability that she answers both questions correctly. (Enter your probability as a fraction.)

2.

Prof. Martinez stimulates interest in homework by requiring two students each to draw a problem at random and solve the problem drawn. On a certain day, **eight** problems were assigned. Anita is to draw first and Al second. They had solved **seven** problems but had not solved one. Find the following probabilities. (Round your answers to three decimal places.)

(a) Anita draws the unsolved problem.

(b) Neither Anita nor Al draws the unsolved problem.

(c) Al does not draw the unsolved problem.

3.

As an incentive to do homework, Professor Rouse randomly draws three students' names, and they are expected to explain a homework problem of the day. On a particular day, **7** students have not done homework and **19** have. Find the following probabilities. (Round your answers to three decimal places.)

(a) The first two drawn have not done homework and the third has.

(b) All three drawn have not done homework.

(c) All three drawn have done homework.

(d) At least one of the three drawn has done homework.

4.

Tim has two irregular coins. The nickel comes up heads **two fifths** of the time, and the quarter comes up heads two thirds of the time. The nickel is tossed.

If the nickel comes up heads, then the quarter is tossed twice.

If the nickel comes up tails, the quarter is tossed once. Find the probability that exactly two tails come up. (Round your answer to three decimal places.)

5.

A box contains **four** black balls, **six** red balls, and **five** green balls. Three balls are drawn, and each one is replaced before the next one is drawn. (See Example 8.)

(a) Find the probability that the balls drawn are red, black, and red in that order. (Round your answers to three decimal places.)

(b) Find the probability that all three balls are green. (Round your answers to three decimal places.)

6.

In a group of college students, 60 males and 70 females, 25% of the males and 40% of the females are from out of state. A student is randomly selected. Find the following probabilities. (See Example 9. Round your answers to three decimal places.)

(a) The person is a female.

(b) The person is from out of state, given that the person is a male.

(c) The person is from out of state when the person is selected from the females.

(d) The person is from out of state.

(e) The person is female when the selection is made from the out-of-state persons.

7.

Northwest Furniture Factory makes desks. Inspectors find that the probability that a desk has a structural defect is 0.03, the probability that it has a defect in finish is 0.05, and the probability of both kinds of defect is 0.02. A desk is randomly selected. Find the probability that it has the following. (Round your answers to two decimal places.)

(a) a structural defect, given that it has a defect in finish

(b) a defect in finish, given that it has a structural defect

8.

In a second-semester English class, 40% of the students are sophomores and the rest freshmen; 20% of the sophomores are repeating the course and 15% of the freshmen gained admission to the course by advanced placement. The professor randomly selects a student to comment on the assignment. (Round your answers to three decimal places.)

(a) Find the probability that the professor selects a sophomore who is repeating the course.

(b) Find the probability that the professor selects a freshman who gained advanced placement admission to the class.

9.

Yolinda, a star basketball player, makes 86% of her free throws. In practice the coach tells her to take five. Find the probability that she makes the first three and misses the last two. (Round your answer to three decimal places.)

10.

E and F are events such that $P(E) = 0.25$, $P(F) = 0.40$, and $P(E \cap F) = 0.10$.

(a) Find $P(F | E)$ and $P(E \cup F)$. (Round your answers to two decimal places.)

$$P(F | E) = \text{ }$$

$$P(E \cup F) = \text{ }$$

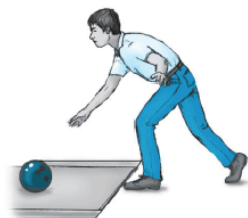
(b) Are E and F independent?

☐ Yes

☐ No

11.

A bowler makes a strike if all ten pins are knocked down with the first ball of a frame. A perfect game consists of 12 consecutive strikes.



(a) Whenever Hoffman rolls a first ball of a frame, the probability of making a strike is **0.5**. Find the probability that Hoffman rolls a perfect game. (Round your answers to six decimal places.)

(b) Whenever McKay rolls a first ball of a frame, the probability of a strike is **0.9**. Find the probability that McKay rolls a perfect game. (Round your answers to six decimal places.)

12.

The probabilities that two students will not show up for class on a beautiful spring day are **0.3** and **0.4**, respectively. It is a beautiful spring day. Find the following probabilities. (See Example 6. Round your answers to two decimal places.)

(a) Neither will show up for class.

(b) Both will show up for class.

(c) Exactly one will show up for class.

13.

A mathematics professor assigns two problems for homework and knows that the probability of a student solving the first problem is **0.70**, the probability of solving the second is **0.50**, and the probability of solving both is **0.05**. (Round your answers to three decimal places.)

(a) Jed has solved the second problem. What is the probability he also solves the first problem?

(b) Edna has solved the first problem. What is the probability she also solves the second problem?

14.

A card is picked from a pack of 52 playing cards. Let F be the event of selecting a **black** card and let G be that of selecting a face card. Are F and G independent events? (Enter your probabilities as fractions.)

Since $P(F \cap G) =$ and $P(F) \times P(G) =$, the events are .

15.

A person draws three balls in succession from a box containing **five** red balls, **two** white balls, and **seven** blue balls. Find the probability that the balls drawn are red, white, and blue, in that order. (See Example 6. Round your answer to three decimal places.)

16.

A French professor gives Sections 1 and 2 of a French course the same passage to translate. Section 1 has **26** students, and **7** translate the passage correctly. Section 2 has **22** students, and **9** translate the passage correctly. (See Example 3.)

(a) If one of the papers is selected at random, what is the probability that it is a correct translation? (Round your answers to three decimal places.)

(b) One of the papers is selected and is known to be from Section 1. What is the probability that it is a correct translation? (Round your answers to three decimal places.)

(c) A paper is selected and is known to be a correct translation. What is the probability that it is from Section 2? (Round your answers to three decimal places.)

17.

Two dice are tossed. What is the probability that their sum will be 3, given that exactly one face shows 2? (Round your answer to three decimal places.)

18.

A hotel located near a medical center has special rates for families receiving treatment at the medical center. Their records show that 60% of room reservations receive the medical rate and 6% of the guests receiving the medical rate request a room designed for the handicapped.

(a) A call is received requesting a room reservation. Find the probability that the person is eligible for the medical rate and requests a handicap room. (Round your answers to four decimal places.)

(b) For two consecutive calls, find the probability that the first is not eligible for the medical rate and the second is eligible but does not request a handicap room. (Round your answers to four decimal places.)

19.

A university cafeteria surveyed the students who ate breakfast there for their coffee preferences. The findings are summarized as follows:

	Do not drink coffee	Prefer regular coffee	Prefer decaffeinated coffee	Total
Female	29	148	64	241
Male	18	196	41	255
Total	47	344	105	496

A student is selected at random from this group. Find the probability of the following. (Round your answers to four decimal places.)

(a) The student does not drink coffee.

(b) The student is male.

(c) The student is a female who prefers regular coffee.

(d) The student prefers decaffeinated coffee, given that the student being selected from the male students.

(e) The student is male, given that the student prefers decaffeinated coffee.

(f) The student is female, given that the student prefers regular coffee or does not drink coffee.