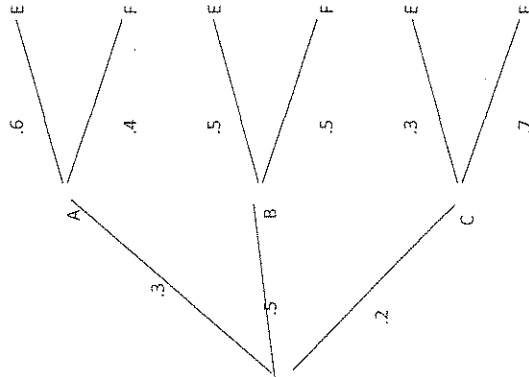


15. The quality control department of Starr Communications, the manufacturer of video game CD's, has determined from records that 1.5% of the CD's have video defects, 0.8% have audio defects and 0.4% have both audio and video defects. What is the probability that a video game purchased by a customer

- a. Will have a video or audio defect (can be both)? $0.015 + 0.004 + 0.004 = 0.019$ 1.9%
- b. Will not have a video or audio defect? $= 0.981$ 98.1%

16. Let E and F be two events and suppose $P(E) = .35$ and $P(F) = .55$ and $P(E \cap F) = .70$. Find

$P(E|F) = \frac{.70}{.55} = .36$



For 17-21, use the tree diagram to find the given probability.

17. $P(A \cap E) = (.3)(.6) = .18$

18. $P(B \cap E) = (.5)(.5) = .25$

19. $P(C \cap E) = (.2)(.3) = .06$

20. $P(A|E) = \frac{.18}{(.18) + (.25) + (.06)} = \frac{.18}{.49} = .367$

21. $P(E) = (.18) + (.25) + (.06) = .49$

22. An experiment consists of tossing a fair coin three times and observing the outcomes. Let A be the event that at least one head is thrown and B the event that at most two tails are thrown.

- a. Find $P(A)$. $= 7/8$
- b. Find $P(B)$. $= 7/8$
- c. Are A and B independent events?

NO

23. **Challenge** In a group of 20 ballpoint pens on a shelf in the stationary department of Metro Department Store, 2 are known to be defective. If a customer selects 3 of these pens, what is the probability that

- a. At least 1 is defective? $P(\text{at least 1}) = 1 - P(\text{none}) = 1 - \left(\frac{18}{20}\right)\left(\frac{17}{19}\right)\left(\frac{16}{18}\right) = .284$
- b. No more than 1 is defective? $\text{none} + 1 = \left(\frac{18}{20}\right)\left(\frac{17}{19}\right)\left(\frac{16}{18}\right) + \frac{18}{20} \cdot \frac{17}{19} \cdot \frac{2}{18} = .284$

24. Five people are selected at random. What is the probability that none of the people in this group were born on the same day of the week? $\frac{7^5}{7^5} = 7^5 \cdot 5^4 \cdot 4^3 = \frac{10807}{2042} = .529$

25. A pair of fair dice is cast. What is the probability that the sum of the numbers falling uppermost is 8 if it is known that the two numbers are different? $\frac{2}{15}$

26. A pair of fair dice is cast three times. What is the probability that it shows an even number in the first toss, an odd number in the second toss, and a 1 on the third toss? Assume that the outcomes of the tosses are independent. $\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{6} = \frac{1}{24}$

27. A fair die is cast, a fair coin is tossed, and a card is drawn from a standard deck of 52 playing cards. Assuming these events are independent, what is the probability that the number falling uppermost on the die is a 6, the coin shows a tail and the card drawn is a face card? $\frac{1}{6} \cdot \frac{1}{2} \cdot \frac{12}{52} = \frac{1}{52} = .019$

For 28-32, three cards are drawn at random from a standard deck of 52 playing cards. Find the probability of each of the given events.

28. All three cards are aces. $\frac{4}{52} \cdot \frac{3}{51} \cdot \frac{2}{50} = \frac{00018}{1000000}$

29. All three cards are face cards. $\frac{12}{52} \cdot \frac{11}{51} \cdot \frac{10}{50} = \frac{00995}{1000000}$

30. The second and third cards are red. $= \left(\frac{26}{52}\right)\left(\frac{25}{51}\right)\left(\frac{24}{50}\right) = \frac{24}{125} = .192$

31. The second card is black, given that the first card was red. $\frac{26}{52}$

32. The second card is a club, given that the first card was black. $\frac{13}{52}$

33. Of 320 male and 280 female employees at the home office of Gibraltar Insurance Company, 160 of the men and 190 of the women are on flex-time (flexible working hours). Given that an employee selected at random from this group is on flex-time, what is the probability that the employee is a man? $\frac{160}{350} = .457$

34. Applicants who wish to be admitted to a certain professional school in a large university are required to take a screening test that was devised by an educational testing service. From past results, the testing service has estimated that 70% of all applicants are eligible for admission and that 92% of those who are eligible for admission pass the exam, whereas 12% of those who are ineligible for admission pass the exam. Using these results, what is the probability that an applicant for admission passed the exam?

