

MA2 16.4-16.6 Review

1.

Central School PTA committee is to consist of 3 teachers and 3 parents, who are to be chosen at random from the 24 teachers and 145 parents involved in the PTA. If half of the teachers and 99 parents are women, find the probability that the committee has:

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- a. only female members
- b. only 1 parent and only 1 teacher who are women

2.

A bag contains 5 red marbles and 3 white marbles. If 2 marbles are randomly drawn, one after the other and without replacement, what is the probability that the number of red marbles is 0? 1? 2? (Check to see that the sum of the probabilities is 1.)

Repeat Exercise 3 if the bag contains 6 red marbles and 2 white marbles; that is, find the probabilities of drawing 0, 1, and 2 red marbles.

3.

Thirteen cards are dealt from a well-shuffled standard deck. What is the probability of getting:

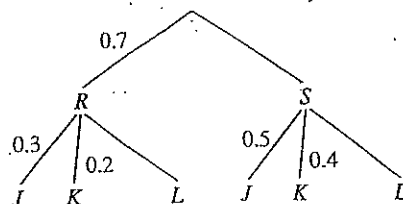
- a. all red cards?
- b. 7 diamonds and 6 hearts?
- c. at least 1 face card?
- d. all face cards?

4.

Ninety-five percent of the sneakers manufactured by a shoe company have no defects. In order to find the 5% that do have defects, inspectors carefully look over every pair of sneakers. Still, the inspectors sometimes make mistakes because 8% of the defective pairs pass inspection and 1% of the good pairs fail the inspection test.

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- a. Incorporate the facts given above into a tree diagram.
- b. What percent of the pairs of sneakers pass inspection?
- c. If a pair of sneakers passes inspection, what is the probability that it has a defect?

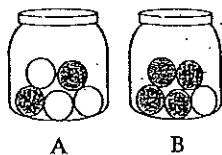


Ex. 2

5. Use the tree diagram at the right above to find each probability.

- a. $P(S)$
- b. $P(L | R)$
- c. $P(L | S)$
- d. $P(J \text{ and } R)$
- e. $P(J \text{ and } S)$
- f. $P(J)$
- g. $P(R | J)$
- h. $P(S | J)$

6. Jar A contains 2 red balls and 3 white balls. Jar B contains 4 red balls and 1 white ball. A coin is tossed. If it shows "heads," a ball is randomly picked from Jar A; if it shows "tails," a ball is randomly picked from Jar B.



- a. Draw a tree diagram showing the probabilities of each jar and then the probabilities of picking a red ball or a white ball.
 b. Find the probability of picking a red ball.
 c. If a red ball is picked, find the probability that it came from Jar A.

7. Suppose you play a game in which 5 coins are tossed simultaneously. 16-6
 If 1, 2, 3, or 4 "heads" occur, you win \$1 for each "head." If all "heads" or all "tails" occur, however, you lose \$20.

- a. Copy and complete the following table.

# of "Heads"	0	1	2	3	4	5
Payoff	-\$20					
Prob.	$\frac{1}{32}$					

- b. What is the game's expected payoff?

8. Find the expected payoff.

Payoff: 9, 7, -5

Prob: 0.1, 0.3, 0.6

- 9.

Payoff: 13, -7, -12

Prob: 0.4, 0.2, 0.4

... decide if each game is a fair game. If not, state which player has the advantage. *How could you make it fair?*

10. A die is rolled. If the number that shows is odd, player A wins \$1 from player B. If it is a 6, A wins \$2 from B. Otherwise B wins \$3 from A.

11. Decide if the following is a fair game; if it is not a fair game, state which player has the advantage: Two dice are rolled. If the sum is less than 7, player A wins \$5 from player B. Otherwise B wins \$4 from A.

12. A box contains 3 red balls and 2 green balls. Two balls are randomly chosen without replacement. If both are green, you win \$2. If just one is green, you win \$1. Otherwise you lose \$1. What is your expected gain or loss?