

**Problems For You To Do (Section 4.4) + 4.5**

1. If the 13 simple events are equally likely find

a)  $P(\overline{A \text{ or } B}) =$

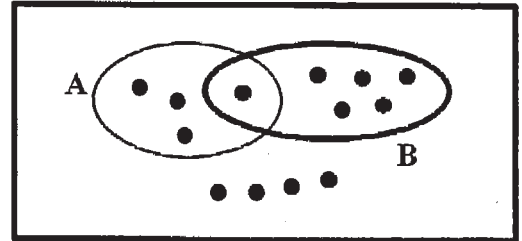
b)  $P(A \text{ and } \overline{B}) =$

c)  $P(B|A) =$

d)  $P(A|\overline{B}) =$

e)  $P(\overline{A \text{ and } B}) =$

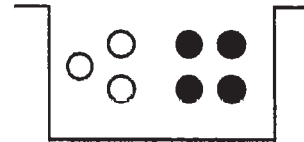
f)  $P(\overline{A \text{ or } B}) =$



2. Randomly select **two** balls from the pot (without replacement).

Find the probability that

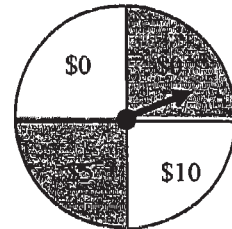
- a) both balls selected are white.
- b) exactly one ball is white.
- c) at least one ball is white.



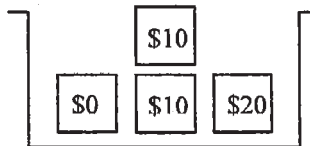
3. Spin the pointer **twice**.

Find the probability that

- a) Only one spin ends up in a shaded region.
- b) The sum of the two spins is \$10.



4. Randomly select **two** bills from the pot from the pot



a) **without** replacement.

Find the probability that

- i) the sum of the two bills is \$20.
- ii) the \$0 bill is the second bill selected.

b) **with** replacement.

Find the probability that

- i) the sum of the two bills is \$20
- ii) the \$0 bill is the second bill selected.

5. Randomly deal **two** cards from a deck of 52 (without replacement). Find the probability that

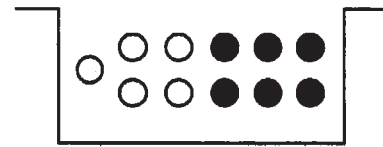
- a) both cards are clubs.
- b) both cards are kings.

6. A fair die is rolled **twice**. Find the probability that

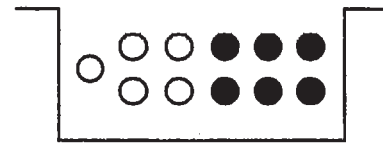
- a) each roll comes up a 6.
- b) neither roll comes up a 5.

7. Lisa and Ian work independently on the same problem. If Lisa has a 90% chance of solving the problem and Ian has a 70% chance of solving it, what is the probability that
- both solve the problem?
  - at least one of them solves the problem?
8. A survey of smokers found that of 1000 women, 200 were heavy smokers and 20 had emphysema. Of those who had emphysema, 13 were heavy smokers. Are being heavy smokers and having emphysema independent?
9. A web page designer bids on two contracts. She estimates that she has a 40% chance of getting the first contract and a 50% chance of getting the second contract. If the contracts are decided independently, what is the probability that she gets **exactly one** of the two contracts?

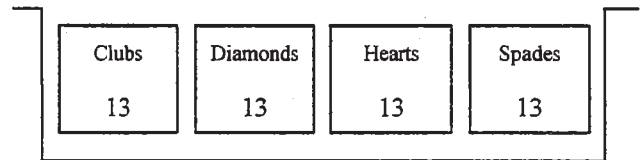
10. Randomly select **three** balls from the pot (without replacement). Find the probability that you get three black balls.



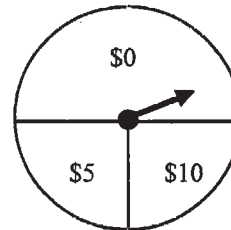
11. Randomly select **five** balls from the pot (without replacement). Find the probability that you get
- five black balls.
  - at least 1 white ball.



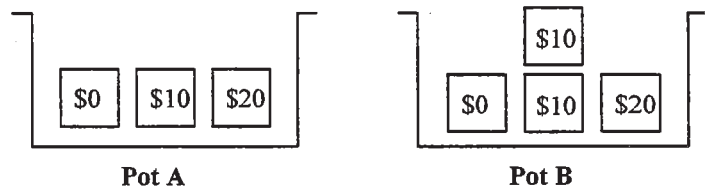
12. Randomly deal **five** cards from a deck of 52. Find the probability that you get
- five clubs.
  - at least one club.



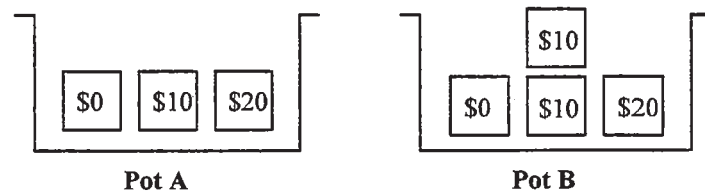
13. Spin the pointer **ten** times. Find the probability that you get
- no \$0's.
  - at least one \$0.



14. Randomly select one bill from Pot A and one from Pot B. What is the probability you get a total of \$20 for the two bills?



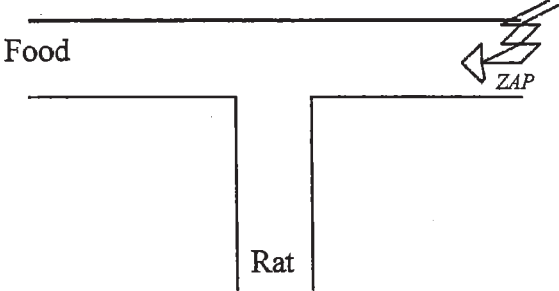
15. Randomly select one bill from Pot A and put it in Pot B. Now randomly select one bill from Pot B. What is the probability that you select a \$10 bill from Pot B?



16. For the experiment in Question 15, if the bill selected from Pot B was a \$10 bill, what is the probability that a \$20 bill was transferred from Pot A to B?
17. The BC Lottery Corporation advertises that there is a  $1/28$  chance that you will win *some* prize each time that you play the BC<sub>49</sub> game. If you play this game once a week for the next 52 weeks, what is the chance that you win *some* prize at least once?

18. The blood group and Rh type for 47 people in a study is summarized in the table to the right.

	A	B	AB	O	
Rh+	10	7	5	13	35
Rh-	3	2	1	6	12
	13	9	6	19	47

- a) If **one** person is selected randomly from the 47 what is the probability that the person
- is type **Rh+** but is not in blood group **B**?
  - is in blood group **A** or is **Rh-**?
- b) What is the probability that a person who is type **Rh-** is from blood group **O**?
- c) If **two** people are selected randomly from the 47 without replacement what is the probability that
- they have different Rh types?
  - they have the same blood type?
- d) If **five** people are selected randomly from the 47 without replacement what is the probability that at least one has blood type **A**?
19. In a T-maze, a rat is given food if she turns left and an electric shock (ouch!) if she turns right. On the first run there is a 50:50 chance that the rat will turn either way. Then, if she received food on the first run, the probability that she turns left on the second run is 0.68. However, if she received a shock on the first run, the probability of turning left on the second run is 0.84.
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- What is the probability that the rat receives food on both runs?
  - What is the probability that the rat receives food on the second run?
  - If a rat turns left on the second run what is the probability that it had also turned left on the first?
20. In a particular social services program
- 70% are single parents
  - 60% are employed
  - Of the 70% that are single parents, 80% of them are employed.
- When one person is randomly selected from this program what is the chance that he/she is a single parent or employed?
  - What percentage of the employed people are single parents?

21. The table below shows 18 possible appointment times in a dentist's appointment schedule.

	Monday	Tuesday	Wednesday	Thursday
Morning	_____	_____	_____ _____	_____ _____
Afternoon	_____ _____ _____ _____	_____ _____ _____	_____ _____ _____ _____	_____

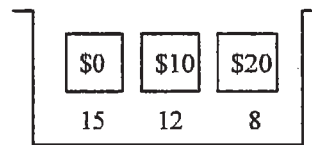
- a) If Erica randomly selects **one** appointment time from the 18,
- what is the probability that she picks a morning time?
  - what is the probability that she picks an afternoon time or a time on Tuesday?
  - for which day of the week are the events "she picks morning" (M) and "she picks [day]" (D) **independent**. Support your answer with a probability argument.

One of Monday, Tuesday, Wednesday, or Thursday

- b) If Thomas randomly selects one appointment time from the 17 remaining after Erica picks hers, what is the probability that at least one of them picks Wednesday?

22 Randomly select three bills from the pot (without replacement).

- What is the probability that you get three \$0 bills?
- What is the probability that you get one bill of each type?



23. Spin the pointer three times. What is the probability that

- all three spins come up at 7?
- each of the three spins comes up at a different number?

