Part II Section 5
Practice Problems

A. The table below shows 200 shirts in terms of colors and size. **(All answers in percentage and round in 2 decimal)**

	Blue	**R**ed	**W**hite
Large	50	40	20
Small	40	20	30

If one shirt is randomly selected then find the following probability that

1) It is red or small **2)** It is white or large **3)** It is white or blue **4)** It is red or white or large

5) If two shirts are randomly selected then find the probability that both shirts are small.

6) If two shirts are randomly selected then find the probability that both shirts are non white. **All answers. on page 3.**

B.

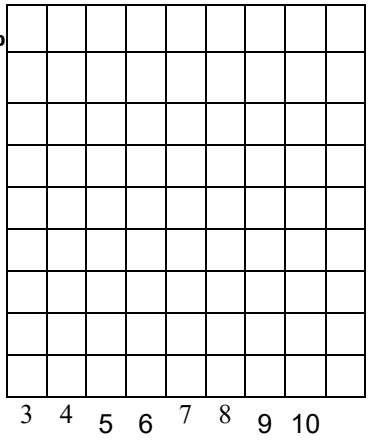
b) From a deck of 52 cards, If we draw one card at random, then what is the probability that it is **A**ce or **R**ed?
Ans: 53.84 %

a) From a deck of 52 cards, If we draw one card at random, then what is the probability that it is **A**ce or **K**ing?
Ans: 15.39

C. Let **Random Variable X** = the number of digital **camcorders sold** in a given day at an electronic store.

B			
x	**f**		
3	8		
4	11		
5	14		
6	19		
7	20		
8	12		
9	9		
10	7		
		1.00 = ?	
Mean = 6.39			

P(x)%



- Complete the table, draw probability distribution (**Answers/P.16**) and find the probability that,

1. At **least** there will be 7 **camcorders sold** in a given day. **Ans: 48 %**
2. At **most** there will be 8 **camcorders sold** in a given day. **Ans: 84 %**
3. Find the **mean** of number of camcorders sold in a given day. ***Mean = 6.39***

C. A $0.5 slot machine in a casino has a winning prize of $10 for each play with winning probability $1/100$. What are the expected results for the players and the house each time the game is played. How much will be the expected to generate revenue if a typical casino has 100 slot machines and each slot machine is played 1000 times a day and 360 days **Ans: $142,200 per year**.

Counting

1) If a password should consist of 2 letters first and 3 digits after, then how many different passwords are possible? L L D D D — 1) ***676,000***

2) If a password should consist of non-repeating of 2 letters first and non-repeating 3 digits after, then how many different passwords are possible? — 2) ***468,000***

L L D D D

3) How many different 3-letter words can be written ending with vowels (a,e,i,o,u)? — 3) ***3,380***

_____ , _____ , _____

4) How many different 3-letter words can be written not ending with vowels (a,e,i,o,u)? — 4) ***14,196***

_____ , _____ , _____

5) How many different 3-digits odd number can be written by using 0,2,1,3,7,8 digits? — 5) ***90***

_____ , _____ , _____

6) How many different 3-letter words can be written ending with letters (e, n, d)? — 6) ***2,028***

_____ , _____ , _____

7) How many different 3-digits even number can be written by using 0,2,1,3,7,8 digits? — 7) ***90***

_____ , _____ , _____

8) In how many ways Joe can dress up, if he has 6 shirts, 7, pants, and 5 pair of shoes? — 8) ***210***

_____ , _____ , _____

9) If a password should consist of non-repeating of 3 letters first and non-repeating 2 digits after, then how many different passwords are possible? — 9) ***1,404,000***

_____ , _____ , _____, _____ , _____

10) If a password should consist of 2 letters first and 2 digits after, then how many different passwords are possible? — 10) ***67,600***

11) How many different 3-letter words can be written ending with letters (a,c,e,t,o,p)? — 11) ***4,056***

_____ , _____ , _____

12) How many different 3-digits even number divisible by 5 can be written by using 0,2,1,3,7,5,8 digits? — 12) ***42***

_____ , _____ , _____

13) How many different 3-digits number divisible by 5 can be written by using 0,2,1,3,7,5,8 digits? — 13) ***84***

_____ , _____ , _____

14) How many different area codes can we have? — 14) ***1000***

_____ , _____ , _____

D. In

Answers

A. **1)** 65% **2)** 70% **3)** 70% **4)** 80% **5)** 20.13% **6)** 56.16%

$a)\ P(A\ or\ R) = P(A) + P(R) - P(A\ and\ R) = \frac{4}{52} + \frac{26}{52} - \frac{2}{52} = \frac{28}{52} = \frac{7}{13} = 53.84\%$

$b)\ P(A\ or\ K) = P(A) + P(K) - P(A\ and\ K) = \frac{4}{52} + \frac{4}{52} - \frac{0}{52} = \frac{8}{52} = \frac{2}{13} = 15.39\%$

B				
x	**f**	**P(x)%**	**x P(x)**	**$X^2P(x)$**
3	8	0.08	0.24	0.72
4	11	0.11	0.44	1.76
5	14	0.14	0.70	3.50
6	19	0.19	1.14	6.84
7	20	0.20	1.40	9.80
8	12	0.12	0.96	7.68
9	9	0.09	0.81	7.29
10	7	0.07	0.70	7.00
	100	1.00	***6.39***	44.59
Mean = 6.39			***St. Dev = 1.94***	

Outcome	x	$p(x)$	$x\,p(x)$
Win	\$10	1/100	\$.10
Lose	\$ -0.5	99/100	\$-.495
		$\sum p(x) = 1$?	$\sum xp(x) =$ \$ **-.395**
(.395)(1000)(100)(360) = \$14,220,000			

Counting

1) If a password should consist of 2 letters first and 3 digits after, then how many different passwords are possible? 2) ***676,000***

$26 \times\ 26 \times\ 10 \times 10 \times 10 =$ **676,000**

2) If a password should consist of non-repeating of 2 letters first and non-repeating 3 digits after, then how many 1) ***468,000*** different passwords are possible?

$26 \times 25 \times 10 \times\ 9 \times 8 =$ **468,000**

3) How many different 3-letter words can be written ending with vowels (a,e,i,o,u)? 3) ***3,380***

$26 \times\ 26 \times\ 5 =$ **3,380**

4) How many different 3-letter words can be written not ending with vowels (a,e,i,o,u)? 4) ***14,196***

$26 \times 26 \times\ 21 =$ **14,196**

5) How many different 3-digits odd number can be written by using 0,2,1,3,7,8 digits? 5) ***90***

$5 \times\ 6\ \times\ 3 =$ **90**

6) How many different 3-letter words can be written ending with letters (e, n, d)? 6) ***2,028***

$26 \times\ 26 \times\ 3 =$ **2,028**

7) How many different 3-digits even number can be written by using 0,2,1,3,7,8 digits? 7) ***60***

$5 \times\ 6\ \times 3 =$ **90**

8) In how many ways Joe can dress up, if he has 6 shirts, 7, pants, and 5 pair of shoes? 8) ***210***

$$6 \times 7 \times 5 = \mathbf{210}$$

9) If a password should consist of non-repeating of 3 letters first and non-repeating 2 digits after, then how many different passwords are possible? 9) ***1,404,000***

$$26 \times 25 \times 24 \times 10 \times 9 = 1{,}404{,}006$$

10) If a password should consist of 2 letters first and 2 digits after, then how many different passwords are possible? 10) ***67,600***

$$26 \times 26 \times 10 \times 10 = \mathbf{67{,}600}$$

11) How many different 3-letter words can be written ending with letters (a,c,e,t,o,p)? 11) ***4,056***

$$26 \times 26 \times 6 = \mathbf{4{,}056}$$

12) How many different 3-digits even number divisible by 5 can be written by using 0,2,1,3,7,5,8 digits? 12) ***42***

$$6 \times 7 \times 1 = \mathbf{42}$$

13) How many different 3-digits number divisible by 5 can be written by using 0,2,1,3,7,5,8 digits? 13) ***84***

$$6 \times 7 \times 2 = \mathbf{82}$$

14) How many different area codes can we have? 14) ***1000***

$$10 \times 10 \times 10 = \mathbf{1000}$$