pg. 639 #1-9, 12-14, 16

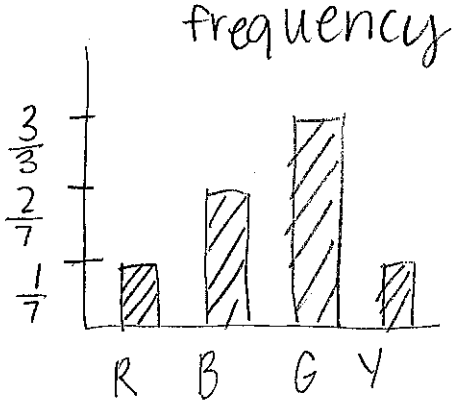
1.

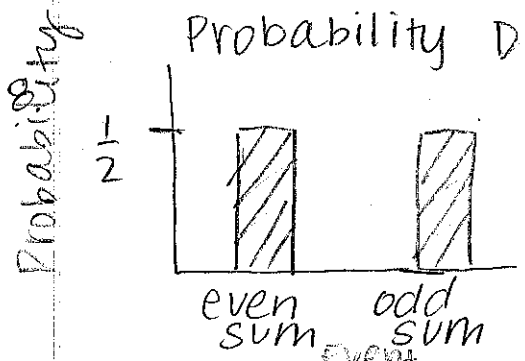
type	tally	frequency
rock	𝍸 𝍸 |	11
paper	𝍸 𝍸	10
scissors	𝍸 𝍸 𝍸	15
		36

3. P(5 or more) $\frac{16+6}{200} = \frac{22}{200} = \frac{11}{100} = 11\%$

6.

color	frequency
red	1/7
blue	2/7
yellow	1/7
green	3/7





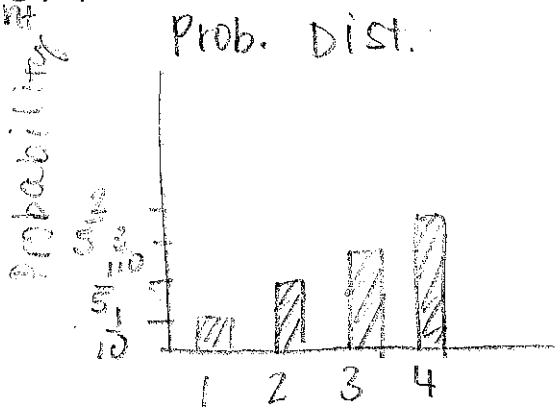
1+1	1+2	1+3	1+4	1+5	1+6
E	O	E	O	E	O
2+1	2+2	2+3	2+4	2+5	2+6
O	E	O	E	O	E

12. $P(1) = \frac{1}{10}$

$P(2) = \frac{2}{10} = \frac{1}{5}$

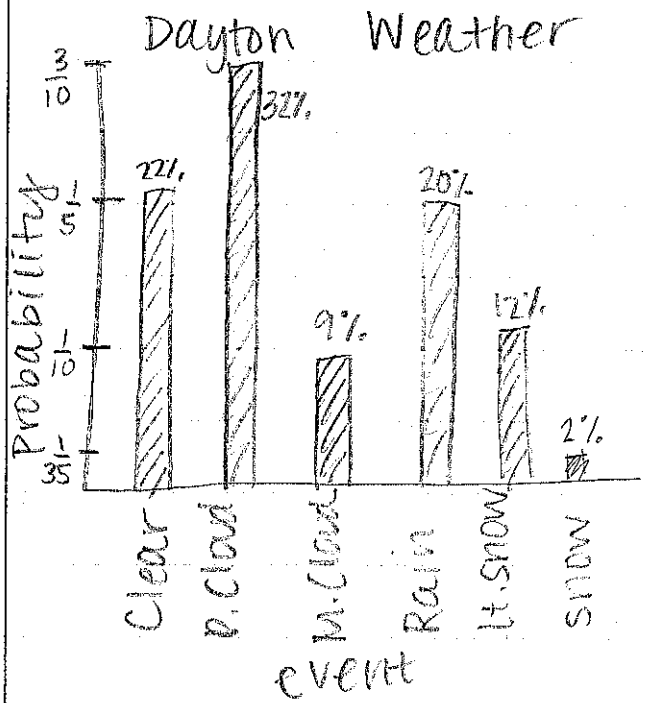
$P(3) = \frac{3}{10}$

$P(4) = \frac{4}{10} = \frac{2}{5}$



14.

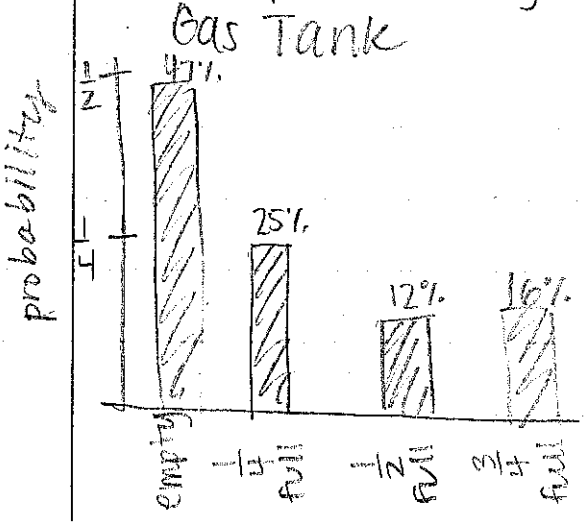
a)



b) independent : weather
dependent: probability

c) P(rain or snow) = P(r) + P(lt.snow) + P(snow)
20% + 12% + 2% = 34%

16. dep: fullness of tank
indep: probability



1.

Object	Frequency
Rock	11
Paper	10
Scissors	15
Total	36

2.

Player	Wins
1	7
2	8
Tie	3
Total	18

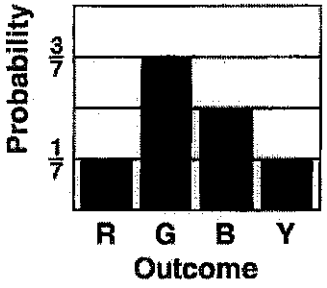
3. 0.11

4. 0.89

5. 0.53

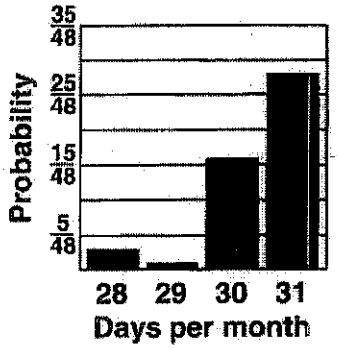
6.

Outcome	Probability
Red	$\frac{1}{7}$
Green	$\frac{3}{7}$
Blue	$\frac{2}{7}$
Yellow	$\frac{1}{7}$

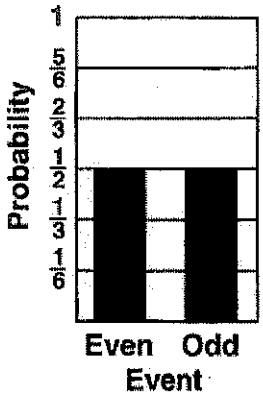


7. Number of Days Per Month

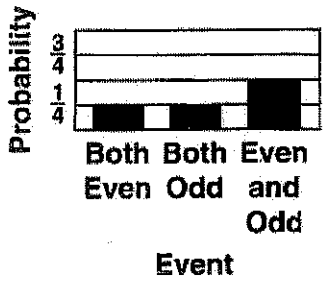
Days	28	29	30	31
Frequency	3	1	16	28
Probability	$\frac{3}{48}$	$\frac{1}{48}$	$\frac{16}{48}$	$\frac{28}{48}$



8.



9.



10. Answers will vary. Sample design: Use random numbers. Assign numbers 1 to 1000 to each event, based on its probability.

Age	Probability	Cumulative Probability	Assigned Numbers
<20	0.051	0.051	1–51
20–29	0.176	0.227	52–227
30–39	0.211	0.438	228–438
40–49	0.211	0.649	439–649
50–59	0.156	0.805	650–805
60–69	0.096	0.901	806–901
70–79	0.070	0.971	902–971
≥80	0.029	1.000	972–1000

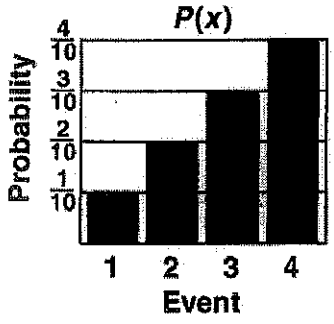
Random numbers generated: 697, 420, 488, 567, 272, 396, 474, 870, 896, 282, 464, 681, 274, 663, 681, 282, 376, 363, 860, 129
Results of simulation: Age 20–29: 1, Age 30–39: 8; Age 40–49: 4, Age 50–59: 4; Age 60–69: 3

11. Answers will vary. Sample design: Use random numbers. Assign numbers 1 to 1000 to each event, based on its probability.

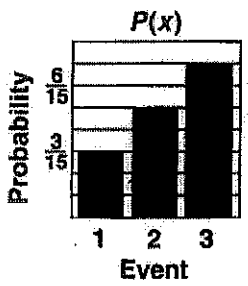
Type	Prob.	Cum. Prob.	Assigned Numbers
Luxury	0.165	0.165	1–165
Large	0.076	0.241	166–241
Midsize	0.527	0.768	242–768
Small	0.232	1	769–1000

Random numbers generated: 612, 904, 249, 194, 435, 772, 93, 236, 80, 370, 849, 468, 819, 800, 371, 14, 396, 278, 303, 662, 637, 572, 700, 196, 810, 314, 496, 408, 737, 624
Results of simulation: 3 luxury cars, 3 large cars, 18 midsize cars, and 6 small cars

12.



13.



14. a.

Weather Conditions in Dayton, Ohio

Type	Frequency	Probability
Clear	82	0.225
Partly Cloudy	118	0.323
Mostly Cloudy	34	0.093
Rain	75	0.205
Light Snow	45	0.123
Snow	11	0.030

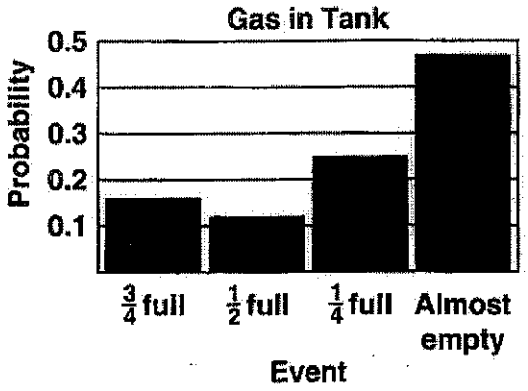
b. The independent variable is the type of weather. The dependent variable is the probability that a type of weather occurs.

c. $\frac{131}{365}$ OR 0.359

15. Chek students' work.

16. a. The independent variable is the amount of gas in the tank; the dependent variable is the percent of people who fill their tanks when they have a given amount of gas.

b.



c. 0.28 or 28%

Arnica Tablets Vitamin Shoppe

Name _____ Class _____ Date _____

Practice 12-1

Probability Distributions

1. Use the frequency table to find each probability.

Persons Living Alone in 1999 (in thousands)

15 to 24 years of age	1,313
25 to 34 years of age	3,714
35 to 44 years of age	4,074
45 to 64 years of age	7,757
65 years and older	9,747

Source: *www.infoplease.com*

a. What is the probability that a person living alone is 45 or older? ≈ 66%.

b. In a sample of 100 persons living alone, predict how many are age 35 and older. 81 people

c. Find P(15 to 24 years of age) $\frac{1313}{26605} \approx 4.9\%$

d. Find P(35 to 44 years of age) $\approx 15\%$

e. Find P(65 years and older) $\approx 37\%$

4074
17504
21,578,000
26,605,000

2. You roll two number cubes. Make a table to show the probability distribution for each sample space.

2a. sum	≤ 5	> 5
freq.	10	26
P	10/36	26/36

a. {the sum of the cubes is 5 or less, the sum is greater than 5}

b. {the sum of the cubes is prime, the sum is composite}

c. {only one cube shows 2, both cubes show the same number, the cubes show different numbers and neither is a 2}

1 1 = 2
1 2 = 3
1 3 = 4
1 4 = 5
1 5 = 6
1 6 = 7
2 1 = 3
2 2 = 4
2 3 = 5
2 4 = 6
2 5 = 7
2 6 = 8
3 1 = 4
3 2 = 5
3 3 = 6
3 4 = 7
3 5 = 8
3 6 = 9
4 1 = 5
4 2 = 6
4 3 = 7
4 4 = 8
4 5 = 9
4 6 = 10
5 1 = 6
5 2 = 7
5 3 = 8
5 4 = 9
5 5 = 10
5 6 = 11
6 1 = 7
6 2 = 8
6 3 = 9
6 4 = 10
6 5 = 11
6 6 = 12

2c.

Sum	2	3	4	5	6	7	8	9	10	11	12
P	1/36	1/18	1/12	1/9	5/36	1/6	5/36	1/9	1/12	1/18	1/36

3. A survey of student pizza preferences showed that 43 students preferred cheese, 56 preferred sausage, 39 preferred pepperoni, 28 preferred supreme, 31 preferred another kind, and 19 did not like any type of pizza.

2b. Sum	P	C
freq	15	21
P	15/36	21/36

a. Organize this data in a frequency table.

b. Find the experimental probability for each outcome in the table. Round to the nearest tenth of a percent. What is the sum of the experimental probabilities? Explain.

c. Graph the probability distribution for {pizza, no pizza}.

d. Graph the probability distribution for {cheese, sausage or pepperoni, supreme or other, no pizza}.

e. How are the probability distributions related?

2c.

sum	one 2	same	diff	no 2
freq	11	6	20	
P	11/36	6/36	20/36	

4. Visitors to the game preserve see up to eight species of large mammals as they drive through. A survey shows that the number of species seen varies according to the distribution below.

Probability Distribution for Number of Species Seen

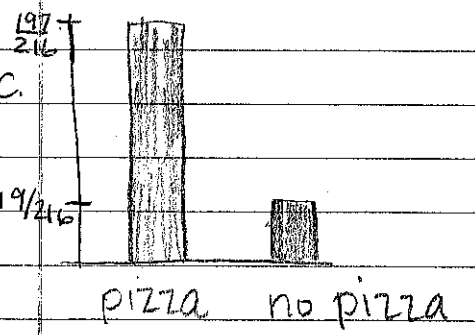
s	0	1	2	3	4	5	6	7	8
$P(s)$	0.08	0.12	0.21	0.18	0.12	0.11	0.09	0.08	0.01

a. Use random numbers to simulate the number of species seen in each of 20 visits to the preserve. What is the average per visit?

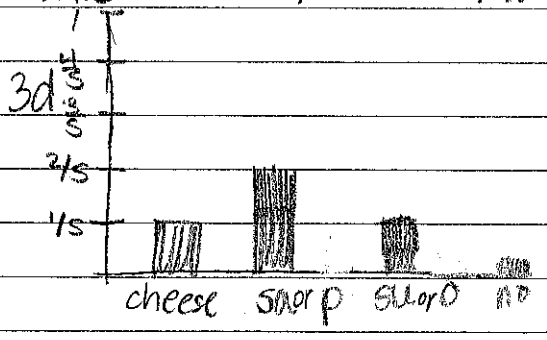
b. You donate $5 to the preserve for upkeep of each species you see. On the basis of your simulation, how much would you donate in 20 visits?

3a. topping	freq.	cumul. freq.	exp. prob.	3b.
Cheese	43	43	43/216 ≈ 20%	
sausage	56	99	56/216 ≈ 26%	
pepperoni	39	138	39/216 ≈ 18%	
supreme	28	166	28/216 ≈ 13%	
other	31	197	31/216 ≈ 14%	
none	19	216	19/216 ≈ 9%	

3c.



3d.



4.

see	P(see)	cumu. P	numbers
0	.08	.08	1-8
1	.12	.2	9-20
2	.21	.41	21-41
3	.18	.59	42-59
4	.12	.71	60-71
5	.11	.82	72-82
6	.09	.91	83-91
7	.08	.99	92-99
8	.01	1	100

trial	
1	7
2	6
3	1
4	3
5	2
6	5
7	0
8	2
9	8
10	2
11	5
12	7
13	2
14	2
15	0
16	7
17	1
18	0
19	3
20	6

$\frac{69}{20} = 3.45$

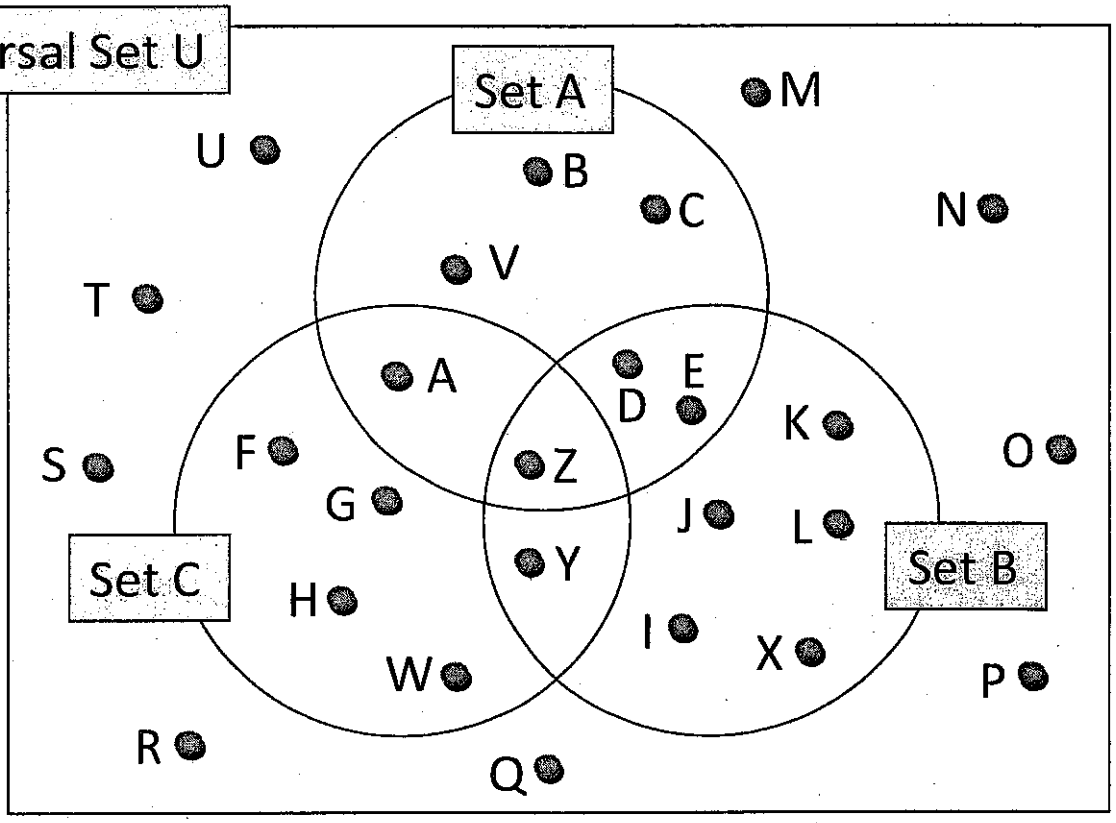
$3(\frac{4}{5}) = 15$

Marble Mania

Name _____

Twenty-six marbles lettered from A to Z are being used in this problem as universal set U.
Subset A contains the letters A, B, C, D, E, V, and Z.
Subset B contains the letters D, E, I, J, K, L, X, Y, and Z.
Subset C contains the letters A, F, G, H, W, Y, and Z.

The diagram below shows the distribution of the marbles.



Directions: If a marble is randomly picked from universal set U, determine these **SET** probabilities.
Note: P(A) means the probability that the marble is in **set** A.

1. P(A) = 7/26 A, B, C, D, E, V, Z
2. P(B) = 9/26
3. P(C) = 7/26 A, F, G, H, W, Y, Z
4. P(A or B) = 13/26 count all of A, all of B
5. P(A or C) = 12/26 count all A, B, C, D, E, F, G, H, V, W, Y, Z
6. P(B or C) = 14/26
7. P(A and B) = 3/26 D, E, Z
8. P(A and C) = 2/26
9. P(B and C) = 2/26 Y, Z
10. P(not A) = 19/26
11. P(not B) = 17/26 26 - (D, E, I, J, K, L, X, Y, Z) = 17
12. P(not C) = 19/26
13. P(A or B or C) = 17/26
14. P(A and B and C) = 1/26 Z
15. P(A and B)^C = 23/26 26 - (D, E, Z)
16. P(A and B and C)^C = 25/26 26 - Z = 25 (letter not number) Z, Y, but not in A
17. P(A or A^C) = 26/26
18. P(B and C and A^C) = 1/26 just Y
19. P(A or B or C^C) = 22/26 A, B, C, D, E, I, J, K, L, V, X, Y, Z, M, N, O, P, Q, R, S, T, U
20. P(B and B^C) = nothing in B and not in B

0/26