Name	**Applications of Math 12**	Block
	Probability Review #2	Date

All fractions must be in lowest terms!

Key

Formulae

$$P(AandB) = P(A) \times P(B)$$

$$P(AorB) = P(A) + P(B) - P(AandB)$$

Multiple Choice - Circle the Best Answer.

1. Which of the following could <u>never</u> be the probability of an event happening?

   a. ½ b. 0 c. 1 d. -¾

2. In a raffle, 500 tickets were sold. What is the probability of winning if you purchased 10 tickets?

   a. $\frac{1}{500}$ b. $\frac{1}{50}$ c. $\frac{1}{5}$ d. $\frac{1}{2}$

3. One card is drawn from a deck of well-shuffled cards. What is the probability that the card is a diamond?

   a. $\frac{1}{52}$ b. $\frac{12}{52}$ c. $\frac{1}{2}$ d. $\frac{1}{4}$

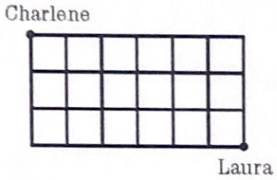
4. Identify the pair of events that are NOT independent:
   a. drawing an ace from a deck and then drawing another ace if the 1st card is not replaced
   b. rolling a 6 on a die and then rolling a 5 on the same die.
   c. flipping heads on a quarter and flipping a tails on a loonie.
   d. drawing the number 2 out of a hat and then drawing a 3 if the 1st number is replaced.

5. A bag contains 3 red balls and 3 white balls. The first draw is a red ball and it is not replaced. What is the probability that the 2nd draw will produce another red ball?

   a. $\frac{1}{2}$ b. $\frac{1}{3}$ c. $\frac{2}{5}$ d. $\frac{1}{6}$

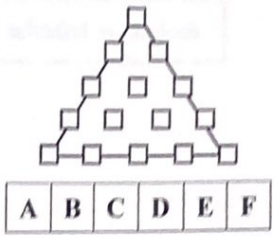
6. What is the total number of pathways from Charlene to Laura?

   a. 25
   b. 38
   c. 56
   d. 69



Answer Key:
Multiple Choice: dbdac cdbaa accbc badba
Written: a. 15/36 = 5/12 b. 9/36 = ¼ c. 11/36

Use the following diagram to answer questions 7 and 8



7. What is the probability of the ball landing in bin A?

a. $\frac{1}{5}$ b. $\frac{1}{8}$ c. $\frac{1}{16}$ d. $\frac{1}{32}$

8. Which bin is the ball most likely to land in?

a. B b. C c. E d. F

9. The probability that a student completes her Math assignment is $\frac{3}{10}$. The probability that she completes her English assignment is $\frac{4}{5}$. What is the probability that she finishes both assignments? Assume the events are independent.

a. $\frac{6}{25}$ b. $\frac{7}{15}$ c. $\frac{1}{2}$ d. $\frac{4}{5}$

Use the following situation to answer questions 10 & 11.

35% of the voters in the region voted NDP in the last election.

10. If 4 voters are selected at random, determine the probability that all 4 voted NDP.

a. 1.5% b. 1.4% c. 4% d. 7%

11. If a random sample of 10 voters is chosen, what is the probability that more than half of them voted NDP?

a. 0.095 b. 0.249 c. 0.751 d. 0.905

12. A six-sided die is rolled 4 times. What is the probability that a 2 will be rolled at least once?

a. 0.67 b. 3.33 c. 0.52 d. 0.48

13. Which of the events below are <u>not</u> mutually exclusive?

a. drawing a heart & drawing a spade
b. drawing an ace & drawing a face card
c. drawing a heart & drawing a face card
d. drawing a red card & drawing a club

Answer Key:
Multiple Choice: dbdac cdbaa accbc badba
Written: a. 15/36 = 5/12 b. 9/36 = ¼ c. 11/36

Use the following situation to answer questions 14 & 15.

Numbers from 1 to 10 (inclusive) are placed in a hat. One number is selected at random.

14. Find the probability that the number is less than 4 or greater than 6.

a. $\frac{3}{25}$ b. $\frac{7}{10}$ c. $\frac{49}{100}$ d. $\frac{1}{10}$

15. Find the probability that the number is odd or greater than 7.

a. $\frac{3}{20}$ b. $\frac{4}{5}$ c. $\frac{7}{10}$ d. $\frac{13}{20}$

16. Two numbers are chosen out of the hat in question 14 instead, without replacement. Select the expression which correctly calculates the probability that the numbers are either both odd or both less than 4.

a. $(\frac{5}{10}\times\frac{5}{10})+(\frac{3}{10}\times\frac{3}{10})-(\frac{2}{10}\times\frac{2}{10})$
b. $(\frac{5}{10}\times\frac{4}{9})+(\frac{3}{10}\times\frac{2}{9})-(\frac{2}{10}\times\frac{1}{9})$
c. $(\frac{5}{10})+(\frac{3}{10})-(\frac{2}{10})$
d. $(\frac{5}{10})+(\frac{2}{9})-(\frac{1}{8})$

17. How many different ways could 6 books be lined up on a shelf?

a. 6! b. 6^6 c. 6×6 d. ${}_6C_6$

18. The School Advisory Board consists of one teacher, one parent and one student. If there are 1100 students, 70 teachers, and 1900 parents to choose from, how many different committees are possible?

b. 3070 b. 78,900 c. 134,100 d. 146,300,000

19. Student numbers at Mathville Secondary have two letters followed by 5 numbers. The first letter is always the first letter of the student's last name. The second letter designates the students house, and is either A,B,C,D or E. The first number can be a 1,2 or 3. The last four numbers can be any digit from 0 to 9. How many different student numbers are possible?

a. 98,415 b. 150,000 c. 2,558,790 d. 3,900,000

20. A survey reports that 86% of couples have kids, 62% of couples have pets, and 4% have neither. What % of couples have pets but no kids?

a. 10% b. 20% c. 24% d. 34%

Answer Key:
Multiple Choice: dbdac cdbaa accbc badba
Written: a. 15/36 = 5/12 b. 9/36 = ¼ c. 11/36

Written Section – Show all work leading to a solution.

1. 2 six sided dice are rolled. Create a sample space that shows all the possible sums. **(2 marks)**

Die1/Die 2	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

a. Find the probability that the sum is less than or equal to 6. **(1 mark)**
b. Find the probability that the sum is less than 4 or greater than 9. **(1 mark)**
c. Find the probability that the sum is less than 9 or greater than 6. **(1 mark)**

a) $\frac{15}{36} = \frac{5}{12}$ b) $\frac{9}{36} = \frac{1}{4}$ c) $\frac{11}{36}$

Answer Key:
Multiple Choice: dbdac cdbaa accbc badba
Written: a. 15/36 = 5/12 b. 9/36 = ¼ c. 11/36