

Mathematics 3201
Unit 3: Probability
Unit Test

Name: _____

Section 1: Selected Response

Circle the letter of the correct answer. (30 points)

1. Given the following probabilities, which event is most likely to occur?
 - A. $P(A) = 0.28$
 - B. $P(B) = \frac{1}{4}$
 - C. $P(C) = 0.27$
 - D. $P(D) = \frac{1}{5}$

2. Raymond has 12 coins in his pocket, and 9 of these coins are quarters. He reaches into his pocket and pulls out a coin at random. Determine the odds against the coin being a quarter.
 - A. 1 : 4
 - B. 1 : 3
 - C. 3 : 4
 - D. 3 : 1

3. Julie draws a card at random from a standard deck of 52 playing cards. Determine the odds in favour of the card being a heart.
 - A. 3 : 1
 - B. 1 : 3
 - C. 1 : 1
 - D. 3 : 13

4. Tia notices that yogurt is on sale at a local grocery store. The last eight times that yogurt was on sale it was available only three times. Determine the probability of yogurt being available this time.
 - A. 0.220
 - B. 0.375
 - C. 0.460
 - D. 0.625

5. The weather forecaster says that there is a 30% probability of fog tomorrow. Determine the odds against fog.
 - A. 3 : 7
 - B. 3 : 10
 - C. 7 : 3
 - D. 7 : 10

6. From a committee of 18 people, 2 of these people are randomly chosen to be president and secretary. Determine the number of ways in which these 2 people can be chosen for president and secretary.
- A. ${}_2P_2$
 - B. ${}_2P_1$
 - C. ${}_{18}P_2$
 - D. ${}_{18}P_{16}$
7. Nine boys and twelve girls have signed up for a trip. Only six students will be selected to go on the trip. Determine the probability that there will be equal numbers of boys and girls on the trip.
- A. 17.23%
 - B. 22.61%
 - C. 27.35%
 - D. 34.06%
8. Cai tosses four coins. Determine the probability that they all land as tails.
- A. 6.25%
 - B. 12.50%
 - C. 18.75%
 - D. 25.00%
9. Select the events that are mutually exclusive.
- A. Drawing a red card or drawing a diamond from a standard deck of 52 playing cards.
 - B. Rolling a sum of 8 or rolling an even number with a pair of six-sided dice, numbered 1 to 6.
 - C. Drawing a black card or drawing a Queen from a standard deck of 52 playing cards.
 - D. Drawing a 3 or drawing an even card from a standard deck of 52 playing cards.
10. Helen is about to draw a card at random from a standard deck of 52 playing cards. Determine the probability that she will draw a black card or a spade.
- A. $\frac{1}{4}$
 - B. $\frac{1}{2}$
 - C. $\frac{29}{52}$
 - D. $\frac{5}{6}$

11. Sarah draws a card from a well-shuffled standard deck of 52 playing cards. Then she draws another card from the deck without replacing the first card. Determine the probability that both cards are NOT face cards.

- A.** $\frac{1}{10}$
- B.** $\frac{1}{3}$
- C.** $\frac{10}{17}$
- D.** $\frac{12}{15}$

12. Misha draws a card from a well-shuffled standard deck of 52 playing cards. Then he puts the card back in the deck, shuffles again, and draws another card from the deck. Determine the probability that both cards are even numbers.

- A.** $\frac{1}{100}$
- B.** $\frac{3}{45}$
- C.** $\frac{6}{15}$
- D.** $\frac{25}{169}$

13. Select the events that are dependent.

- A.** Rolling a 2 and rolling a 5 with a pair of six-sided dice, numbered 1 to 6.
- B.** Drawing an odd card from a standard deck of 52 playing cards, putting it back, and then drawing another odd card.
- C.** Drawing a spade from a standard deck of 52 playing cards and then drawing another spade, without replacing the first card.
- D.** Rolling an even number and rolling an odd number with a pair of six-sided dice, numbered 1 to 6.

14. A five-colour spinner is spun, and a die is rolled. Determine the probability of spinning yellow and rolling a 6.

- A.** 2.42%
- B.** 3.33%
- C.** 6.13%
- D.** 7.75%

15. Two cards are drawn, without being replaced, from a standard deck of 52 playing cards. Determine the probability of drawing a five then drawing a two.

- A.** 0.603%
- B.** 1.227%
- C.** 1.613%
- D.** 2.009%

Section 2: Constructed Response (36 points)
Answer all questions showing all work.

- 1.** A credit card company randomly generates temporary five-digit pass codes for cardholders. Meghan is expecting her credit card to arrive in the mail. Determine, to the nearest hundredth of a percent, the probability that her pass code will consist of five different even digits.
- 2.** From a committee of 18 people, 3 of these people are randomly chosen to be president, vice-president, and secretary. Determine, to the nearest hundredth of a percent, the probability that Evan, Elise, and Jaime will be chosen.
- 3.** Sonja has letter tiles that spell MICROWAVE. She has selected four of these tiles at random. Determine, to the nearest tenth of a percent, the probability that the tiles she selected are two consonants and two vowels.
- 4.** Homer hosts a morning radio show in Halifax. To advertise his show, he is holding a contest at a local mall. He spells out NOVA SCOTIA with letter tiles. Then he turns the tiles face down and mixes them up. He asks Marie to arrange the tiles in a row and turn them face up. If the row of tiles spells NOVA SCOTIA, Marie will win a new car. Determine the probability that Marie will win the car. Show your work.
- 5.** 8 friends are lining up to get in to see the Hunger Games: Catching Fire movie, including Bob and Sam.
 - A)** What is the probability that Bob and Sam will be next to each other.
 - B)** What is the probability that they will not be next to each other?

- 6.** The probability that Haley will exercise on Sunday is 0.6. The probability that she will go shopping on Sunday is 0.5. The probability that she will do both is 0.3. Determine the probability that Haley will do at least one of these activities on Sunday

- 7.** The probability that a plane will leave Toronto on time is 0.90. The probability that a plane will leave Toronto on time and arrive in Saskatoon on time is 0.53. Determine the probability that a plane will arrive in Saskatoon on time, given that it left Toronto on time. Show your work.

- 8.** Bonita has six identical red marbles and ten identical blue marbles in a paper bag. She pulls out one marble at random and then another marble, without replacing the first marble. Determine the probability that she pulls out a pair of red marbles.

- 9.** A five-colour spinner is spun, and a four-sided die is rolled. Determine the probability of spinning orange and rolling a 1.