

Practice Test 2: Probability

K: _____	C: _____	A: _____	T: _____
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PART A: Multiple Choice Questions (Knowledge)**Instructions: Circle the English letter of the best answer. Circle one and **ONLY** one answer.**

1. If something is certain, the probability is

- (a) $\frac{1}{2}$ (b) 1 (c) 0 (d) 100 (e) undefined

2. A bag has identical balls of these colours: 2 white, 3 red, 5 green, and 8 purple. Without looking, a ball is drawn from the bag. It is most likely to be:

- (a) white (b) red (c) green (d) purple (e) either red or green

3. When a coin is tossed 2 times, what is the total number of possible outcomes?

- (a) 1 (b) 2 (c) 4 (d) 8 (e) 16

4. What could be the experimental probability of drawing a black face card from a deck of playing cards with the jokers removed?

- (a) $\frac{3}{52}$ (b) $\frac{6}{50}$ (c) $\frac{6}{52}$ (d) $\frac{12}{52}$ (e) $\frac{2}{52}$

5. The letters of the word MATHEMATICS are written on cards (one letter per card) and placed in a bag. Without looking, a card is drawn from the bag. What is the probability of drawing a letter that is a vowel?

- (a) $\frac{1}{11}$ (b) $\frac{2}{11}$ (c) $\frac{3}{11}$ (d) $\frac{4}{11}$ (e) $\frac{5}{11}$

6. Two coins are tossed simultaneously. What is the probability of tossing one head and one tail?

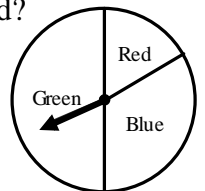
- (a) 0% (b) 25% (c) 50% (d) 75% (e) 100%

7. A coin is tossed three times. What is the probability of tossing three heads in succession?

- (a) $\frac{1}{8}$ (b) $\frac{1}{3}$ (c) $\frac{3}{8}$ (d) $\frac{1}{2}$ (e) $\frac{7}{8}$

8. If you spin this spinner 30 times, how many times do you expect the pointer to land on red?

- (a) 1 (b) 3 (c) 5 (d) 10 (e) 15



Part B: Full Solution Questions

Instructions: Show all steps for full mark. Marks will be deducted for poor or improper form. Provide answer statements in complete English sentences where applicable.

Knowledge:

1. In Tim's coffee shop, a study was done to see how many people buy coffee and a doughnut. Of 160 people who came in one day, 60 bought coffee and a doughnut. The rest bought either coffee or a doughnut. Find the experimental probability that the next person will buy both coffee and a doughnut, as a fraction in lowest terms, as a decimal and as a percent. [K: 3]

2. From a standard deck of 52 playing cards plus two jokers. Find the probability of each event. Express each answer as a fraction in lowest terms. [K: 3]
(a) a red card (b) an ace, 2, or 3 (c) a red card that is not a face card

3. Two dice are rolled. Find the probability that the sum of the numbers is: [K: 3]
(a) 10 (b) not 10 (c) greater than 3

4. A study has found that 23% of the fish in a lake is trout. If a large fish trap is set and it captures 126 fish. How many of these fish are likely to be trout? [K: 1]

Communication:

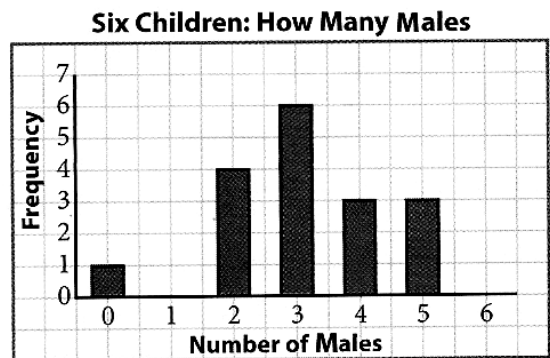
5. Complaints were made to a computer manufacturer about malfunctioning computer chips. The computer promptly tested 10 different chips from the production line and found them all to be working properly.

(a) Does this mean the chips are likely all working properly? Explain. [C: 2]

(b) How could the company do better quality control? [C: 1]

6. A probability experiment was designed to find the expected number of males in a family of six children. To simulate the genders of the six children, a coin was tossed six times. Heads represented a male; tails represented a female. The experiment was repeated a number of times. The results are shown in the graph.

(a) How many trials were performed? [C: 1]



(b) What is the experimental probability of having two males in a family of six children? [C: 1]

(c) Are the results from this experiment a good predictor of experimental probability? Explain. [C: 2]

7. A local radio station surveyed 200 students from one high school to determine their favourite music. The results are shown in the table. Is it possible that the poll might not be accurate? Name a factor that could have influenced the responses? [C: 2]

Music	Percent of Students
Rock	65
Rap	5
Country	30

8. Describe the similarities and differences between statistics and experimental probability. [C: 3]

9. Two dice were rolled 20 times. Doubles were rolled 5 times.

(a) Is the experimental probability of rolling doubles the same as its theoretical probability? Justify your answer. [C: 2]

(b) If you were to roll the dice 20 more times, would you expect five doubles again? Explain. [C: 2]

Application:

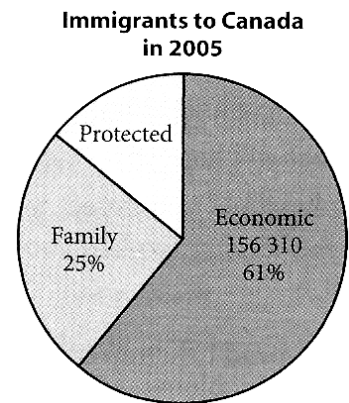
10. A basketball player made 40 out of 50 free throws in last week’s games.

(a) Find the player’s free-throw percentage. [A: 1]

(b) If the player averages eight free throws per game, how many of them should she expect to make? [A: 1]

11. Immigrants come to Canada for a variety of reasons. A report from Citizenship and Immigration Canada divides the reasons into three categories: business/economic, family, and protected persons. In 2005, there were 256 246 new immigrants.

(a) Find the number of people in the “family” and “protected” categories. [A: 1]



(b) If an immigrant to Canada does not fall into the “protected” category, find the probability, as a percent, that he or she came to Canada for business/economic reasons. [A: 1]

Thinking:

12. Matthews has black socks, white socks, blue jeans, dress pants, a red shirt, a green shirt, and a T-shirt.

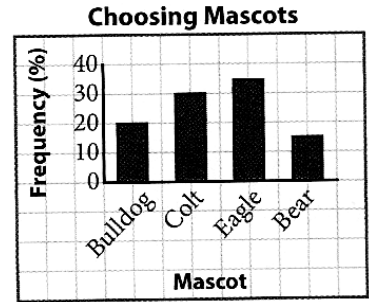
(a) Draw a tree diagram showing his choices for socks, pants, and shirt. [T: 4]

(b) Find the probability that he selects at random blue jeans and the T-shirt. [T: 1]

(c) Find the probability that he selects at random black socks, dress pants and a red shirt. [T: 1]

(d) Find the probability that he selects at random white socks and not the T-shirt. [T: 1]

13. The school council at Jackson Secondary School surveyed 80 students to help select a new football team mascot. The results are shown in the graph. However, Johnson Secondary School already has an eagle as their mascot. So, those at Jackson Secondary who chose an eagle are asked to vote for another animal instead. What is the probability that a person who originally voted for an eagle will now vote for a bear? [T: 3]



Answers:

Part A: 1. b; 2. d; 3. c; 4. c; 5. d; 6. c; 7. a; 8. c.

Part B:

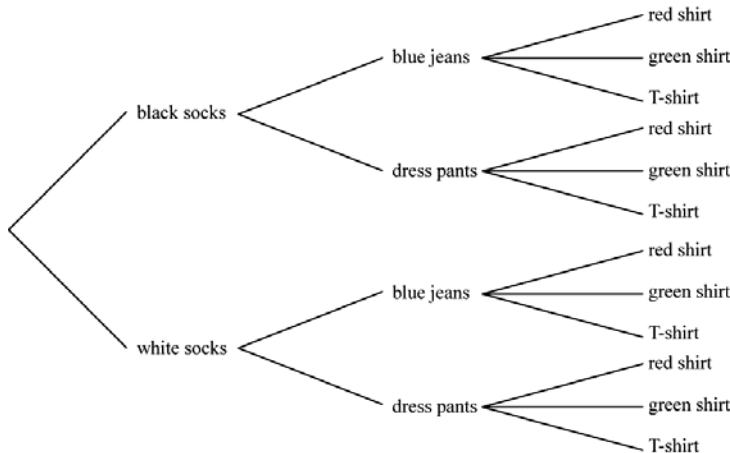
1. $\frac{3}{8}$, 0.375, 37.5%; 2. (a) $\frac{13}{27}$, (b) $\frac{2}{9}$, (c) $\frac{10}{27}$; 3. (a) $\frac{1}{12}$, (b) $\frac{11}{12}$, (c) $\frac{11}{12}$; 4. 29;

5. (a) No. The computer chips may or may not be working perfectly. Examining only ten out of likely thousands of chips is too small a sample to judge if the chips are all working properly. (b) Test a reasonably larger sample on a regular basis. 6. (a) 17, (b) $\frac{4}{17}$, (c) No. There is not enough data to make a generalized conclusion for

prediction, and there are many other factors that may influence the outcomes of having how many males in a family of 6 children. 7. Yes. Factors can be type of music normally played by the radio station conducting the survey, school/family culture, peer pressure while completing the survey, and popular music teachers or bands within the school. 8. Both statistics and experimental probability are used for making predictions about future events. Statistics involves gathering data from real-life events, whereas, experimental probability involves

recording results from simulating real-life events. 9. (a) No. The experimental probability is $\frac{1}{4}$, and it is higher than the theoretical probability of $\frac{1}{6}$, (b) No. In a probability experiment, the results for the second set of trials are unlikely to be exactly the same as for the first set. 10. (a) 80%, (b) $6(8 \times 80\%)$; 11. (a) 99 936, (b) 71%;

12. (a)



(b) $\frac{1}{6}$, (c) $\frac{1}{12}$, (d) $\frac{1}{3}$;

13. $\frac{3}{13}$
 $(\frac{12}{52}, 65\% \text{ of } 80 = 52, 15\% \text{ of } 80 = 12).$