

Math 206 - Test 1

February 19, 2014

Name _____

Score _____

Show all work. Supply explanations where necessary.

1. (3 points) Suppose a letter is selected at random from the word *SENSELESSNESS*.

(a) Give a possible sample space for this experiment.

(b) Is your sample space uniform? Explain.

(c) Describe an event that has a probability greater than 0.25 but less than 0.5. Give the probability of your event.

2. (3 points) Consider the number $5/17$.

(a) Use your calculator to find the decimal form. Round to the nearest ten-thousandth.

(b) Does the decimal form repeat or terminate?

(c) Your calculator should show ten digits of the decimal form. Are you surprised that it has neither terminated nor begun to repeat after those ten digits? Explain.

3. (3 points) Four letters are selected one at a time, without replacement, from the word INTELLIGENT. What is the probability of selecting the letters LING in that order?

4. (4 points) Consider the experiment of drawing one number at random from the box shown below.

$\sqrt{16}$	$-2/17$	0	$\sqrt{5}$	π	$3.\overline{14}$	$5.131331333\dots$
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(a) What is the event of drawing an irrational number?

(b) What is the probability of drawing a natural number?

(c) What is the probability of drawing a rational number?

(d) What are the odds in favor of drawing a number with a repeating decimal form?

5. (2 point) Isaac is wearing his sombrero as he sits under an apple tree. The area of his sombrero is 3 ft^2 . The apple tree covers 96 ft^2 . What is the probability that Isaac will be hit by a randomly falling apple?

6. (3 points) A dart lands at random on the board shown below. The thrower wins the amount of money associated with the dart's location. What is the probability that the thrower wins more than \$7? Briefly explain your reasoning.

\$2	\$6	
	\$8	\$9
	\$4	

7. (4 points) Write $0.\overline{37}$ as a fraction in lowest terms.

8. (3 points) A jar is filled with colored marbles. The probability of selecting a red marble is $37/60$. Is it possible that the probability of selecting a blue marble is $2/5$? Explain.

9. Box 1 contains 3 red marbles and 2 blue marbles. Box 2 contains 1 red marble, 3 blue marbles, and 3 green marbles. A marble is selected at random from Box 1 and placed into Box 2. Then a marble is selected from Box 2.

(a) (5 points) Sketch the complete tree diagram for this experiment. Include the probabilities of each path.

(b) (1 point) What is the probability that a blue marble is selected from Box 2?

(c) (1 point) Use your probability from part (b) to determine the probability that a non-blue marble is selected from Box 2.

(d) (2 points) What is the probability of selecting a red marble from Box 1 or a green marble from Box 2?

10. (2 points) The odds in favor of the event A are $20/7$. What is $P(\bar{A})$?

11. (3 points) Sam was interested in answering the following question:

If a PSC student is chosen at random, what is the probability that the student is taking a math class?

To answer his question, Sam asked 75 students as they passed through the doors, and 43 were taking a math class.

(a) Sam assigned the probability a value of $43/75$. Is this a theoretical or experimental probability?

(b) What would Sam need to do to assign the other type of probability?

12. (4 points) Without using your calculator or doing division, write each fraction as a terminating decimal.

(a) $\frac{7}{8}$

(b) $\frac{9}{1500}$

13. (4 points) Suppose A , B , and C are events such that $P(A) = 0.26$, $P(B) = 0.55$, and $P(C) = 0$. Compute each of the following.

(a) $P(\overline{C})$

(b) $P(A \cup B)$ if A and B are mutually exclusive

(c) $P(A \cap B)$ if $P(A \cup B) = 0.67$

(d) The odds against B

14. (3 points) Each situation below describes a multistage experiment. Determine the best number of stages for each.

(a) A pair of dice are rolled.

(b) A marble is selected from one jar and placed into a second jar. Then two marbles are selected from the second jar.

(c) A small bag contains a variety of coins. Four coins are selected at random.