

MATH 170: EXAM 02

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Answer the questions in the spaces provided on the question sheets and turn them in at the end of the class period. Unless otherwise stated, all supporting work is required. You may only use a four-function calculator. No graphing calculators or cell phones are allowed.

Name: _____

1. PROBLEMS

Questions 1-3 are multiple choice, and the options in each case are "sometimes," "always," and "never." "Sometimes" indicates that the statement is true under certain conditions but false under other conditions. "Always" indicates that the statement is true unconditionally. "Never" indicates that the statement is not true under any condition.

1 (1 point). *If S is the sample space for an experiment and E is an event, then the probability of E is given by*

$$P(E) = \frac{n(E)}{n(S)}.$$

(a) *Sometimes*

(b) *Always*

(c) *Never*

2 (1 point). $P(n, r)$ is the number of **ordered** lists of r items chosen from a set of n items.

(a) *Sometimes*

(b) *Always*

(c) *Never*

3 (1 point). If S is the sample space for an experiment and A and B are events, then

$$P(A \cup B) = P(A) + P(B).$$

(a) *Sometimes*

(b) *Always*

(c) *Never*

4 (20 points). Complete the following probability distribution table and then calculate the stated probabilities.

Outcome	a	b	c	d	e
Probability	0.1	0.07	0.4	0.03	

(a) $P(E \cup F)$, where $E = \{a, c, e\}$ and $F = \{b, c, e\}$.

(b) $P(E)$, where E is as in part (b).

5 (20 points). *Complete the relative frequency distribution. Check that the resulting distribution satisfies the properties of a relative frequency distribution.*

Outcome	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
Rel. Frequency	<i>0.3</i>		<i>0.2</i>	<i>0.05</i>	

6 (20 points). *Find the (modeled) probability of the following event, assuming that the coins are distinguishable and fair, and that what is observed are the faces uppermost. Three coins are tossed; the result is at least one head.*

7 (20 points). *A die is weighted in such a way that 6 is three times as likely to come up as any of the other numbers. Find the probability distribution. What is the probability of rolling more than a 4?*

8 (20 points). *Whenever Suzan sees a bag of marbles, she grabs a handful at random. She has seen a bag containing four red marbles, three green ones, four white ones, and one purple one. She grabs eight of them. Find the probability of the following event, expressing it as a fraction (you do not need to put it in lowest terms).*

She has at most one purple marble.