

MTH 156-PROBABILITY ONE (PR1): SAMPLE EXAM

Some questions may ask you about a "word." The usage of "word" in this case means any combination of letters, not necessarily dictionary words. The alphabet contains 5 vowels and a standard deck of playing cards contains 52 cards.

PROBLEM 1. Let A, B and C be subsets of the universe $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8\}$ where $A = \{1, 3, 6\}$, $B = \{2, 3, 5\}$, and $C = \{2, 6, 7, 8\}$ Then the set $(A \cup B)'$ is

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|---------------------------|---------------------|---------------|------------------------------|
| A. $\{0, 1, 3, 4, 5, 6\}$ | B. $\{1, 3, 5\}$ | C. $\{3\}$ | D. $\{1, 2, 3, 5, 6\}$ |
| E. $\{6, 7, 8\}$ | F. $\{2\}$ | G. $\{1, 3\}$ | H. $\{0, 1, 2, 4, 6, 7, 8\}$ |
| I. $\{2, 3, 5, 6, 7, 8\}$ | J. $\{0, 4, 7, 8\}$ | | |

PROBLEM 2. Superburger sells hamburgers with choice of ketchup, mustard and relish. One day they sold 256 hamburgers; 140 had mustard, 140 had ketchup, 84 had ketchup and relish, 62 had mustard but no relish, 68 had ketchup and mustard, 38 had all three condiments and 20 had none. The number sold with relish only is closest to

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| A. 26 | B. 28 | C. 30 | D. 22 | E. 16 |
| F. 18 | G. 24 | H. 12 | I. 20 | J. 10 |

PROBLEM 3. The number sold with no relish is closest to

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|--------|-------|--------|-------|-------|
| A. 104 | B. 92 | C. 112 | D. 84 | E. 80 |
| F. 100 | G. 96 | H. 108 | I. 88 | J. 76 |

PROBLEM 4. A factory has two production lines making cans: Line A and Line B. Line A produces 40% of the cans. Experience shows that 2% of the cans produced by line A are defective and 4% of the cans produced by line B are defective. A can is taken from their common storage room and found to be defective. The probability it was produced by line A is closest to

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|--------|--------|--------|--------|--------|
| A. .31 | B. .25 | C. .41 | D. .23 | E. .39 |
| F. .33 | G. .37 | H. .27 | I. .35 | J. .29 |

PROBLEM 5. Two dice are thrown and the sum of the number of dots on the dice are noted. The probability that the sum is less than or equal to 7 is closest to

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|--------|--------|--------|--------|--------|
| A. .54 | B. .66 | C. .34 | D. .58 | E. .42 |
| F. .30 | G. .46 | H. .26 | I. .50 | J. .62 |

PROBLEM 6. A jar contains 2 red marbles, 3 green marbles, 4 blue marbles, and 5 yellow marbles. Two marbles are drawn in succession, without replacement. The probability that neither is yellow is closest to

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|--------|--------|--------|--------|--------|
| A. .36 | B. .44 | C. .34 | D. .42 | E. .38 |
| F. .46 | G. .50 | H. .52 | I. .40 | J. .54 |

EXAM CONTINUES ON BACK OF SHEET

MTH 156-PROBABILITY ONE (PR1): SAMPLE EXAM

PROBLEM 7. The odds in favor of snow today are 1:4. The probability it will snow today is closest to

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|--------|--------|--------|--------|--------|
| A. .20 | B. .22 | C. .32 | D. .36 | E. .26 |
| F. .16 | G. .28 | H. .18 | I. .30 | J. .34 |
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PROBLEM 8. A bag contains 5 red, 3 green, 12 white and 7 blue marbles. One is drawn at random. What is the probability it is not white if it is not green? The probability is closest to

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| A. .475 | B. .495 | C. .490 | D. .455 | E. .480 |
| F. .460 | G. .465 | H. .500 | I. .450 | J. .485 |
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PROBLEM 9. Let A and B represent two independent events with $P(A)=.5$ and $P(A' \cap B)=.3$. The probability of B is closest to

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|--------|--------|--------|--------|--------|
| A. .75 | B. .60 | C. .51 | D. .72 | E. .81 |
| F. .63 | G. .69 | H. .78 | I. .57 | J. .54 |
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PROBLEM 10. Compute the probability that a three letter word made from any letters of the alphabet contains no vowels. Round your answer to four digits after the decimal point. The last (rightmost) digit in the answer is

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| A. 5 | B. 2 | C. 4 | D. 7 | E. 1 |
| F. 3 | G. 8 | H. 0 | I. 9 | J. 6 |
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PROBLEM 11. A rectangular enclosure is to be built with 3 sides made out of redwood fencing at a cost of \$7 per running foot, and the fourth side made out of cement blocks at a cost of \$14 per running foot. \$1,680 is available for the project. The maximum possible area of such an enclosure is closest to

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|---------|---------|---------|---------|---------|
| A. 1900 | B. 2000 | C. 2100 | D. 2200 | E. 2300 |
| F. 2400 | G. 2500 | H. 2600 | I. 2700 | J. 2800 |

PROBLEM 12. The length of the side with cement blocks is closest to

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| A. 26 | B. 28 | C. 30 | D. 32 | E. 34 |
| F. 36 | G. 38 | H. 40 | I. 42 | J. 44 |

The correct answers are: 1-J, 2-G, 3-H, 4-B, 5-D, 6-I, 7-A, 8-H, 9-B, 10-I, 11-F, 12-H