

Exam 3 Review

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Tell whether the statement is true or false.

1) $7 \notin \{14, 21, 28, 35, 42\}$

A) True

B) False

1) _____

Let $A = \{1, 3, 5, 7\}$; $B = \{5, 6, 7, 8\}$; $C = \{5, 8\}$; $D = \{2, 5, 8\}$; and $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$. Determine whether the given statement is true or false.

2) $U \subseteq A$

A) True

B) False

2) _____

Use a Venn Diagram and the given information to determine the number of elements in the indicated region.

3) $n(A) = 33$, $n(B) = 15$, $n(A \cup B) = 42$, $n(B') = 40$. Find $n(A \cap B)'$.

A) 36

B) 13

C) 42

D) 49

3) _____

4) At Southern States University (SSU) there are 719 students taking Finite Mathematics or Statistics. 328 are taking Finite Mathematics, 476 are taking Statistics, and 85 are taking both Finite Mathematics and Statistics. How many are taking Statistics but not Finite Mathematics?

A) 634

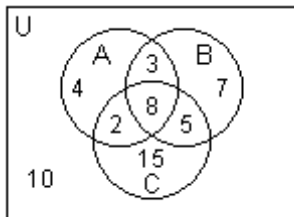
B) 243

C) 158

D) 391

4) _____

Use the Venn diagram below to find the number of elements in the region.



5) $n(A \cap C)$

A) 2

B) 10

C) 37

D) 18

5) _____

Use the addition principle for counting to solve the problem.

6) If $n(B) = 24$, $n(A \cap B) = 5$, and $n(A \cup B) = 42$, find $n(A)$.

A) 25

B) 23

C) 21

D) 24

6) _____

Provide an appropriate response.

7) In a group of 42 students, 22 take history, 17 take biology and 8 take both history and biology. How many students take neither biology nor history?

A) 5

B) 11

C) 8

D) 22

7) _____

- 8) License plates are made using 3 letters followed by 3 digits. How many plates can be made if repetition of letters and digits is allowed? 8) _____
- A) 1,000,000
 B) 175,760
 C) 17,576,000
 D) 308,915,776
 E) 1,757,600

Solve the problem.

- 9) How many ways can a committee of 4 be selected from a club with 12 members? 9) _____
- A) 11,880 B) 248 C) 495 D) 24

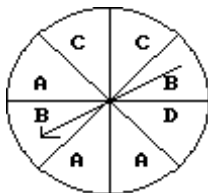
Find the probability.

- 10) Two 6-sided dice are rolled. What is the probability that the sum of the two numbers on the dice will be greater than 9? 10) _____
- A) 6 B) $\frac{1}{6}$ C) $\frac{1}{12}$ D) $\frac{1}{4}$

- 11) A lottery game has balls numbered 1 through 15. A randomly selected ball has an even number or a 4. 11) _____
- A) $\frac{10}{3}$ B) $\frac{3}{10}$ C) 7 D) $\frac{7}{15}$

Find the odds.

- 12) If the sectors are of equal size, what are the odds of spinning an A on this spinner? 12) _____



- A) 3:5 B) 6:2 C) 4:2 D) 2:6

Solve the problem.

- 13) A drug company is running trials on a new test for anabolic steroids. The company uses the test on 400 athletes known to be using steroids and 200 athletes known not to be using steroids. Of those using steroids, the new test is positive for 390 and negative for 10. Of those not using steroids, the test is positive for 10 and negative for 190. What is the estimated probability of a *false negative* result (the probability that an athlete using steroids will test negative)? 13) _____
- A) 0.975 B) 0.95 C) 0.025 D) 0.05

The graduates at a southern university are shown in the table.

	Art & Science A	Education E	Business B	Total
Male, M	342	424	682	1448
Female, F	324	102	144	570
Total	666	526	826	2018

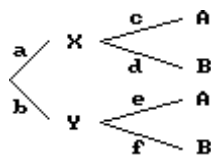
A student is selected at random from the graduating class.

- 14) Find the probability that the student is female, given that an education degree is not received, $P(F | E')$. 14) _____

A) $P(F | E') = \frac{102}{526}$ B) $P(F | E') = \frac{324}{666}$ C) $P(F | E') = \frac{117}{373}$ D) $P(F | E') = \frac{424}{526}$

Use the tree diagram to find the requested probability.

- 15) Find $P(X|A)$. Give your answer as a decimal and round your answer to three decimal places if necessary. 15) _____



$a = 0.8, b = 0.2, c = 0.4, d = 0.6, e = 0.7, f = 0.3$

A) 0.291 B) 0.4 C) 0.696 D) 0.32

Use a tree diagram to find the indicated probability.

- 16) In the town of Cheraw, a certain type of laptop computer is sold at just two stores. Store A has 38% of the sales, 4% of which are of defective items, and store B has 62% of the sales, 2% of which are of defective items. A person receives one of these laptop computers as a gift. What is the probability it is defective? 16) _____

A) 0.42 B) 0.03 C) 0.014 D) 0.028

Use Bayes' rule to find the indicated probability.

- 17) Two stores sell a certain MP3 players. Store A has 34% of the sales, 5% of which are of defective items, and store B has 66% of the sales, 1% of which are of defective items. The difference in defective rates is due to different levels of pre-sale checking of the product. A person receives a defective item of this product as a gift. What is the probability it came from store B? 17) _____

A) 0.5667 B) 0.275 C) 0.7083 D) 0.22

- 18) An water well is to be drilled in the desert where the soil is either rock, clay or sand. The probability of rock $P(R) = 0.53$. The clay probability is $P(C) = 0.21$. The sand probability is $P(S) = 0.26$. If it rock, a geological test gives a positive result with 35% accuracy. If it is clay, this test gives a positive result with 48% accuracy. The test gives a 75% accuracy for sand. Given the test is positive, what is the probability that soil is clay, $P(\text{clay} | \text{positive})$? 18) _____

A) $P(\text{clay} | \text{positive}) = 0.385$ B) $P(\text{clay} | \text{positive}) = 0.405$
 C) $P(\text{clay} | \text{positive}) = 0.53$ D) $P(\text{clay} | \text{positive}) = 0.209$

Find the expected value.

- 19) A fair coin is tossed three times, and a player wins \$3 if 3 tails occur, wins \$2 if 2 tails occur and loses \$3 if no tails occur. If one tail occurs, no one wins. What is the expected value of the games? 19) _____
- A) \$2.00 B) \$0.75 C) \$3.00 D) -\$3.00
- 20) Mr. Cameron is sponsoring an summer concert. He estimates that he will make \$300,000 if it does not rain and make \$60,000 if it does rain. The weather bureau predicts the chance of rain is 0.34 for the day of the concert. An insurance company is willing to insure the concert for \$150,000 against rain for a premium of \$30,000. If he buys this policy, what are his expected earnings from the concert? 20) _____
- A) \$180,000 B) \$300,000 C) \$239,400 D) \$270,000

Answer Key

Testname: 1324-REVIEW3-SU17

- 1) A
- 2) B
- 3) D
- 4) D
- 5) B
- 6) B
- 7) B
- 8) C
- 9) C
- 10) B
- 11) D
- 12) A
- 13) C
- 14) C
- 15) C
- 16) D
- 17) B
- 18) D
- 19) B
- 20) C