Math 1324 – Finite
Professor: Fred Khoury

Practice Exam 3

Let U = {q, r, s, t, u, v, w, x, y, z}; A = {q, s, u, w, y}; B = {q, s, y, z}; and C = {v, w, x, y, z}. List the members of the indicated set, using set braces.

1) $A \cap B'$ 1) _____

A) {r, s, t, u, v, w, x, z}
B) {t, v, x}
C) {u, w}
D) {q, s, t, u, v, w, x, y}

2) $A' \cup B$ 2) _____

A) {q, s, t, u, v, w, x, y}
B) {r, s, t, u, v, w, x, z}
C) {q, r, s, t, v, x, y, z}
D) {s, u, w}

3) $A \cup (B \cap C)$ 3) _____

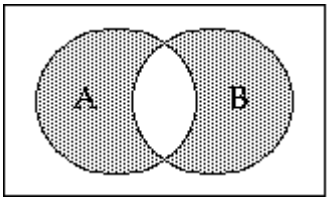
A) {q, y, z}
B) {q, s, u, w, y, z}
C) {q, w, y}
D) {q, r, w, y, z}

4) $B' \cap (A \cup C')$ 4) _____

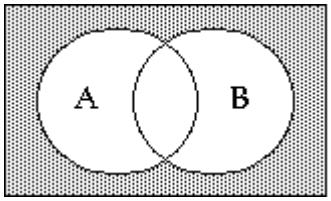
A) {q, r, s, t, u, v, w, x, y}
B) {r, t, u, w}
C) {r, t, u}
D) {q, r, s, t, u, w}

5) Shade the Venn diagram to represent the set. $(A \cup B) \cap (A \cap B)'$ 5) _____

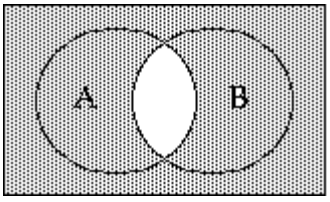
A)



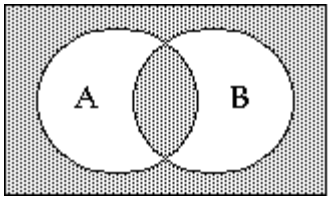
B)



C)

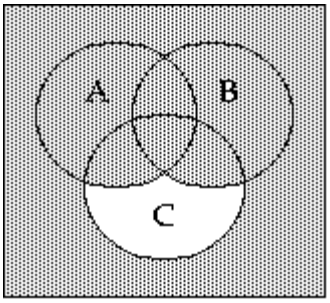


D)

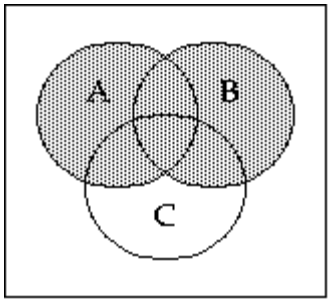


6) $(A \cap B \cap C')'$ 6) _____

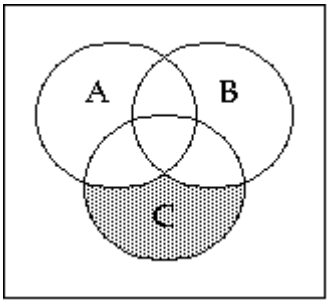
A)



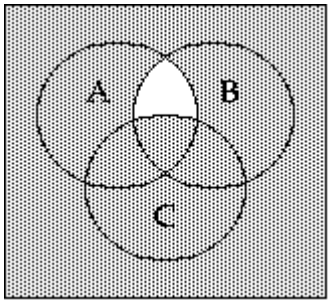
B)



C)



D)



7) If $n(A) = 15$, $n(A \cup B) = 43$, and $n(A \cap B) = 11$; what is $n(B)$? 7) _____

A) 39 B) 28 C) 40 D) 38

8) $n(A \cup B \cup C) = 133$, $n(A \cap B \cap C) = 18$, $n(A \cap B) = 38$, $n(A \cap C) = 35$, $n(B \cap C) = 33$, $n(A) = 91$, $n(B) = 66$, and $n(C) = 64$. Find $n(A' \cap B \cap C)$ 8) _____

A) 15 B) 14 C) 17 D) 16

9) $n(U) = 99$, $n(A) = 35$, $n(B) = 29$, $n(C) = 46$, $n(A \cap B) = 5$, $n(A \cap C) = 4$, $n(B \cap C) = 4$, and $n(A \cap (B \cap C)) = 2$. Find $n(A \cap (B \cup C)')$. 9) _____

A) 29 B) 28 C) 2 D) 1

10) At East Zone University (EZU) there are 629 students taking College Algebra or Calculus. 219 are taking College Algebra, 498 are taking Calculus, and 88 are taking both College Algebra and Calculus. How many are taking Algebra but not Calculus? 10) _____

A) 43 B) 410 C) 131 D) 541

11) A survey of a group of 110 tourists was taken in St. Louis. The survey showed the following: 11) _____
59 of the tourists plan to visit Gateway Arch;
47 plan to visit the zoo;
10 plan to visit the Art Museum and the zoo, but not the Gateway Arch;
12 plan to visit the Art Museum and the Gateway Arch, but not the zoo;
17 plan to visit the Gateway Arch and the zoo, but not the Art Museum;
7 plan to visit the Art Museum, the zoo, and the Gateway Arch;
14 plan to visit none of the three places.
How many plan to visit the Art Museum only?

A) 57 B) 96 C) 14 D) 34

12) A survey of 123 college students was done to find out what elective courses they were taking. Let A = the set of those taking art; B = the set of those taking basket weaving; and C = the set of those taking canoeing. The study revealed the following information: 12) _____
$n(A) = 45$; $n(B) = 55$; $n(C) = 40$;
$n(A \cap B) = 12$; $n(A \cap C) = 15$; $n(B \cap C) = 23$;
$n(A \cap B \cap C) = 2$.
How many students were not taking any of these electives?

A) 10 B) 33 C) 41 D) 31

13) How many 4-digit numbers can be formed using the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, if repetitions of digits are allowed? 13) _____

A) 9000 four-digit numbers B) 256 four-digit numbers
C) 8999 four-digit numbers D) 10,000 four-digit numbers

14) Given a group of students: G = {Allen, Brenda, Chad, Dorothy, Eric} or G = {A, B, C, D, E}, count the different ways of choosing the following officers or representatives for student congress. Assume that no one can hold more than one office. A treasurer and a secretary if the two must not be the same sex 14) _____

A) 3 B) 10 C) 12 D) 6

15) Four accounting majors, two economics majors, and three marketing majors have interviewed for five different positions with a large company. Find the number of different ways that five of these could be hired. Two accounting majors must be hired first, then one economics major, then two marketing majors. 15) _____

A) 24 ways B) 288 ways C) 4 ways D) 144 ways

16) Decide whether the situation involves permutations or combinations. An arrangement of 8 people for a picture. 16) _____

A) Permutation B) Combination

17) Decide whether the situation involves permutations or combinations. A sample of 5 items taken from 71 items on an assembly line. 17) _____

A) Permutation B) Combination

18) Of the 2,598,960 different five-card hands possible from a deck of 52 playing cards, hov many would contain the following cards? 18) _____

All four jacks

A) 48 hands B) 144 hands C) 1152 hands D) 192 hands

19) If a license plate consists of four digits, how many different licenses could be created having at least one digit repeated. 19) _____

A) 10,000 licenses B) 5040 licenses
C) 4960 licenses D) 3024 licenses

20) How many two-digit counting numbers do not contain any of the digits 1, 3, or 9? 20) _____

A) 81 numbers B) 72 numbers C) 49 numbers D) 42 numbers

21) In how many ways can a student select 7 out of 10 questions to work on an exam? 21) _____

A) 21 ways B) 720 ways
C) 10,000,000 ways D) 120 ways

22) A single fair die is rolled. Find the probability of the number on the die is not 6. 22) _____

A) $\frac{5}{6}$ B) $\frac{2}{3}$ C) $\frac{35}{36}$ D) $\frac{1}{6}$

23) A single fair die is rolled. Find the probability of the number on the die is greater than 2. 23) _____

A) $\frac{2}{3}$ B) $\frac{1}{3}$ C) $\frac{5}{6}$ D) $\frac{1}{6}$

24) When a single card is drawn from a well-shuffled 52-card deck, find the probability of getting a jack. 24) _____

A) $\frac{1}{13}$ B) $\frac{1}{26}$ C) $\frac{1}{4}$ D) $\frac{1}{52}$

25) A card is drawn from a well-shuffled deck of 52 cards. What is the probability of drawing an ace or a 7? 25) _____

A) $\frac{13}{2}$ B) 8 C) $\frac{2}{13}$ D) $\frac{4}{13}$

26) A bag contains 8 red marbles, 7 blue marbles, and 3 green marbles. What is the probability that a randomly selected marble is blue? 26) _____

A) $\frac{7}{18}$ B) $\frac{1}{6}$ C) $\frac{7}{15}$ D) $\frac{4}{9}$

27) The age distribution of students at a community college is given below. 27) _____

Age (years)	Number of students (f)
Under 21	415
21-25	413
26-30	209
31-35	58
Over 35	29
	1124

A student from the community college is selected at random. Find the probability that th student is at least 31. Round your answer to three decimal places.

A) 0.923 B) 87 C) 0.077 D) 0.052

28) When two balanced dice are rolled, there are 36 possible outcomes. Find the probability that the second die is 4 or the sum of the dice is 7. 28) _____

A) $\frac{1}{3}$ B) $\frac{5}{18}$ C) $\frac{1}{36}$ D) $\frac{11}{36}$

29) If $P(A \cup B) = 0.61$, $P(A) = 0.32$, and $P(A \cap B) = 0.16$, find $P(B)$. 29) _____

A) 0.37 B) 0.58 C) 0.45 D) 0.52

30) Find the odds in favor of rolling a number less than 3 when a fair die is rolled. 30) _____

A) 2 to 3 B) 1 to 3 C) 1 to 1 D) 1 to 2

31) Find the odds *against* correctly guessing the answer to a multiple choice question with 4 possible answers. 31) _____

A) 4 : 1 B) 3 : 1 C) 3 : 4 D) 4 : 3

32) The odds in favor of a horse winning a race are posted as 5 : 4. Find the probability that the horse will win the race. 32) _____

A) $\frac{1}{2}$ B) $\frac{5}{9}$ C) $\frac{4}{9}$ D) $\frac{4}{5}$

33) Of the coffee makers sold in an appliance store, 5.0% have either a faulty switch or a defective cord, 1.8% have a faulty switch, and 0.7% have both defects. What is the probability that a coffee maker will have a defective cord? Express the answer as a percentage. 33) _____

A) 3.9% B) 5.0% C) 2.5% D) 5.7%

34) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability ***All orange*** 34) _____

A) 0.0061 B) 0.7272 C) 0.0182 D) 0.0011

35) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability ***All lemon*** 35) _____

A) 1 B) 0.061 C) 0 D) 0.1212

36) A bag contains 6 cherry, 3 orange, and 2 lemon candies. You reach in and take 3 pieces of candy at random. Find the probability **2** ***orange,*** **1** ***lemon*** 36) _____

A) 0.3636 B) 0.1091 C) 0.0303 D) 0.0364

37) 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? 37) _____

A) $\frac{1}{4}$ B) $\frac{1}{12}$ C) $\frac{1}{6}$ D) 6

38) A roulette wheel contains 24 slots numbered 1 through 24. The odd number slots are colored purple and even number slots are colored blue. When the wheel is spun, a ball rolls around the rim and falls into a slot. What is the probability that the ball falls into an even number slot? 38) _____

A) 0.52 B) 0.5 C) 0.45 D) 0.6

39) A ring contains 8 keys: 1 red, 1 blue, and 6 gold. If the keys are arranged at random on the ring, find the probability that the red is next to the blue. 39) _____

A) 0.143 B) 0.25 C) 0.047 D) 0.286

40) A calculator requires a keystroke assembly and a logic circuit. Assume that 88% of the keystroke assemblies and 97% of the logic circuits are satisfactory. Find the probability that a finished calculator will be satisfactory. Assume that defects in keystroke assemblies are independent of defects in logic circuits. 40) _____

A) 0.9300 B) 0.7744 C) 0.8536 D) 0.9409

41) 44% of a store's computers come from factory A and the remainder come from factory B. 2% of computers from factory A are defective while 2% of computers from factory B are defective. If one of the store's computers is selected at random, what is the probability that it is not defective and from factory A? 41) _____

A) 0.009 B) 0.980 C) 0.98 D) 0.431

42) Two shipments of components were received by a factory and stored in two separate bins. Shipment I has 2% of its contents defective, while shipment II has 5% of its contents defective. If it is equally likely an employee will go to either bin and select a component randomly, what is the probability that a defective component came from shipment II? 42) _____

A) 0.5 B) 0.25 C) 0.333 D) 0.714

43) For two events M and N, P(M) = 0.5, P(N|M) = 0.7, and P(N|M') = 0.3. Find P(M|N). 43) _____

A) 0.70 B) 1.0 C) 0 D) 0.30

44) A person must select one of three boxes, each filled with clocks. The probability of box A being selected is 0.19, of box B being selected is 0.1, and of box C being selected is 0.71. The probability of finding a red clock in box A is 0.2, in box B is 0.4, and in box C is 0.9. A box is selected. Given that the box contains a red clock, what is the probability that box A was chosen? 44) _____

A) 0.133 B) 0.19 C) 0.053 D) 0.038

45) A company is conducting a sweepstakes, and ships two boxes of game pieces to a particular store. Box A has 5% of its contents being winners, while 1% of the contents of box B are winners. Box A contains 21% of the total tickets. The contents of both boxes are mixed in a drawer and a ticket is chosen at random. What is the probability it came from box A if it is a winner? 45) _____

A) 0.01 B) 0.583 C) 0.417 D) 0.833

Answer Key
Testname: FINITE_PRACTICE 3

1) C
2) C
3) B
4) B
5) A
6) D
7) A
8) A
9) B
10) C
11) C
12) D
13) D
14) C
15) D
16) A
17) B
18) A
19) C
20) D
21) D
22) A
23) A
24) A
25) C
26) A
27) C
28) D
29) C
30) D
31) B
32) B
33) A
34) A
35) C
36) D
37) C
38) B
39) D
40) C
41) D
42) D

43) A
44) C
45) B