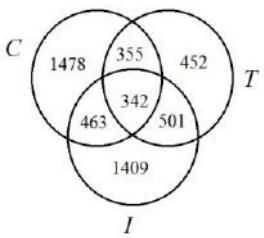
3. PROBLEMS

Problem 1. In a survey, 95 television viewers offered their opinions about program *A* and program *B*. Of those viewers, 28 liked neither program *A* nor program *B*, while 20 liked both program *A* and program *B*. If 25 viewers liked program *A* only, how many viewers liked program *B* only?
(A) 3 (B) 10 (C) 15 (D) 22 (E) 35

Problem 2. In an assortment of cereals, 43 types contain oats and 55 types contain rice. Some of these cereals contain both oats and rice. If 15 cereals in this assortment contain oats but not rice, how many cereals contain rice but not oats?
(A) 28 (B) 27 (C) 15 (D) 12 (E) 55

Problem 3. In a survey, 5000 students selected their usual methods of communication with friends from the following three options: calling (*C*), text messaging (*T*), or instant messaging (*I*). The Venn diagram above shows the results of the survey. How many students selected exactly one of the three methods of communicating?
(A) 342 (B) 1319 (C) 1478 (D) 452 (E) 3339



Problem 4. Sets *P* and *Q* are shown below. If *x* is a member of set *P* and *y* is a member of set *Q*, which of the following CANNOT be equal to the product *xy* ?
$P = \{1, 3, 5, 6, 11\}$
$Q = \{2, 4, 6, 7, 9, 13\}$
(A) 39 (B) 143 (C) 16 (D) 21 (E) 24

Problem 5. Of 40 people, 28 smoke and 16 chew tobacco. It is also known that 10 both smoke and chew. How many among the 40 neither smoke nor chew?
(A) 10 (B) 8 (C) 2 (D) 6 (E) 4

Problem 6. How many integers between 1 and 600 inclusive are not divisible by neither 3, nor 5, nor 7?
(A) 325 (B) 105 (C) 275 (D) 200 (E) 300

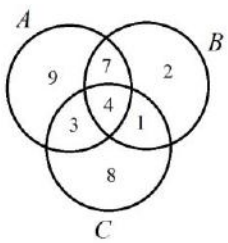
Problem 7. Of 10 boxes, 5 contain pencils, 4 contain pens, and 2 contain both pens and pencils. How many boxes contain neither pens nor pencils?
(A) 3 (B) 7 (C) 6 (D) 8 (E) 5

Problem 8. In a class of 50 students, 28 take science, 21 take French, and 5 students take both classes. How many students take neither class?
(A) 6 (B) 11 (C) 45 (D) 7 (E) 23

Problem 9. In a survey of 120 eighth graders, 84 liked math, 73 liked science, and 23 liked math but not science. How many students disliked both subjects?
(A) 26 (B) 31 (C) 40 (D) 24 (E) 25

Problem 10. A class of 31 students was polled about which soft drink was their favorite. Seventeen students liked Fizz-Up, eighteen liked Fizz-Down, and six students didn't like either. How many students liked both?
(A) 4 (B) 6 (C) 10 (D) 0 (E) 16

Problem 11. The number of elements in sets *A, B*, and *C* are shown in the diagram. How many elements belong to *A* or *B* but not *C*?
(A) 14 (B) 16 (C) 18 (D) 10 (E) 24



☆ **Problem 12.** How many numbers between 1 and 2015 are integer multiples of 3 or 5 but not 15?
(A) 403 (B) 671 (C) 835 (D) 268 (E) 806

Problem 13. 8th graders have three after-class activities: Tennis, Drawing, and Art. In Tennis club, there are 25 students; Drawing: 24 students; and Art: 30 students. 5 students are in both Tennis and Art clubs; 2 students are in both Tennis and Drawing clubs; 4 students are in both Art and Drawing clubs; and 1 student is

in all of the three clubs. How many students in 8^{th} grade are involved in all three after-class activities?

(A) 64 (B) 66 (C) 69 (D) 54 (E) 56

Problem 14. 85 people subscribed to three magazines A, B, and C. 49 people subscribed to A, 62 subscribed to B, and 41 subscribed to C. 24 subscribed to A and B. 22 subscribed to B and C. 25 subscribed to A and C. How many people subscribed to all three?

(A) 6 (B) 4 (C) 10 (D) 20 (E) 16

Problem 15. In a class of 25 students, 18 like pizza and 12 like spaghetti. What is the greatest possible number of students who dislike both pizza and spaghetti?

A) 7 (B) 9 (C) 6 (D) 20 (E) 12

Problem 16. Alex, Bob and Charlie are watering 100 flowerpots. Alex watered 76 pots, Bob watered 69 pots, and Charlie watered 85 pots. At least how many flowerpots have been watered three times?

A) 20 (B) 30 (C) 50 (D) 38 (E) 23

Problem 17. Every camper at camp EKO is required to take exactly two of the three crafts classes offered. One summer, 47 campers took basket weaving, 59 took cabinet making, and 34 took pottery. How many campers attended camp EKO that summer?

A) 70 (B) 48 (C) 60 (D) 30 (E) 16

Problem 18. In a class of twenty students, five like to go camping and ten like to ride bikes. What is the greatest possible number of students that like to do neither?

A) 10 (B) 8 (C) 6 (D) 12 (E) 14

Problem 19. There are 52 students in a class. 30 of them can swim. 35 can ride bicycle. 42 can play table tennis. At least how many students can do all three sports?

A) 7 (B) 8 (C) 6 (D) 3 (E) 30