

New York Additional Topics Lesson 4 NY P. 743: Union and Intersection of Sets

Part 1: Operations on Sets

1. fall0710ia, P.I. A.A.31

Given:

$$\text{Set } A = \{(-2, -1), (-1, 0), (1, 8)\}$$

$$\text{Set } B = \{(-3, -4), (-2, -1), (-1, 2), (1, 8)\}$$

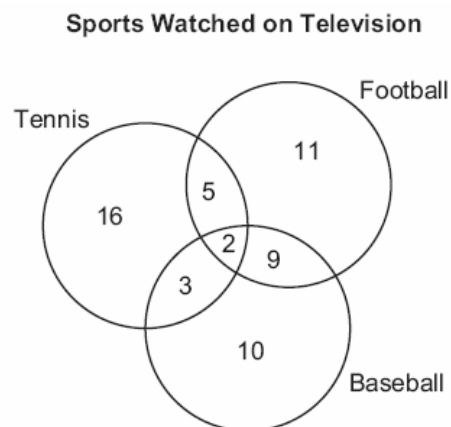
What is the intersection of sets A and B ?

- [A] $\{(-2, -1), (1, 8)\}$ [B] $\{(1, 8)\}$
[C] $\{(-2, -1)\}$
[D] $\{(-3, -4), (-2, -1), (-1, 2), (-1, 0), (1, 8)\}$

Part 2: Solving Problems With Venn Diagrams

2. 060203a, P.I. A.RP.11

The accompanying diagram shows the results of a survey asking which sports the members of the Key Club watch on television.



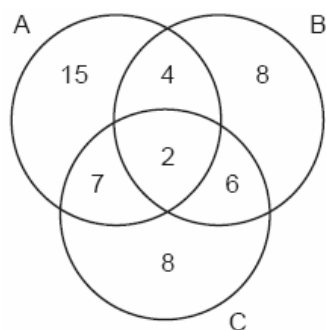
Which statement or statements are true?

- I The most watched sport is tennis.
II The least watched sport is baseball.
III More Key Club members watch tennis than football.

- [A] I, only [B] II and III, only
[C] II, only [D] I and II, only

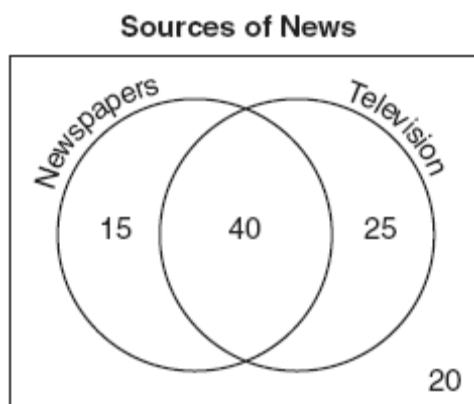
3. 060026a, P.I. A.RP.11

The accompanying Venn diagram shows the number of students who take various courses. All students in circle A take mathematics. All in circle B take science. All in circle C take technology. What percentage of the students take mathematics or technology?



4. 010621a, P.I. A.RP.11

The accompanying Venn diagram shows the results of a survey asking 100 people if they get news by reading newspapers or by watching television.



What is the probability that a person selected at random from this survey does *not* claim television as a source of getting the news?

- [A] $\frac{75}{100}$ [B] $\frac{55}{100}$ [C] $\frac{35}{100}$ [D] $\frac{15}{100}$

5. 080117a, P.I. A.RP.11

In a class of 450 students, 300 are taking a mathematics course and 260 are taking a science course. If 140 of these students are taking both courses, how many students are not taking either of these courses?

- [A] 40 [B] 30 [C] 110 [D] 140

6. 069919a, P.I. A.RP.11

In a class of 50 students, 18 take music, 26 take art, and 2 take both art and music. How many students in the class are not enrolled in either music or art?

- [A] 24 [B] 16 [C] 8 [D] 6

7. 060436a, P.I. A.RP.11

The senior class at South High School consists of 250 students. Of these students, 130 have brown hair, 160 have brown eyes, and 90 have both brown hair and brown eyes. How many members of the senior class have *neither* brown hair *nor* brown eyes?

8. 080226a, P.I. A.RP.11

In a telephone survey of 100 households, 32 households purchased Brand A cereal and 45 purchased Brand B cereal. If 10 households purchased both items, how many of the households surveyed did *not* purchase either Brand A or Brand B cereal?

9. 060533a, P.I. A.RP.11

In a survey of 400 teenage shoppers at a large mall, 240 said they shopped at Abernathy's, 210 said they shopped at Bongo Republic, and 90 said they shopped at both stores. How many of the teenage shoppers surveyed did not shop at either store?

10. 080631a, P.I. A.RP.11
In Clark Middle School, there are 60 students in seventh grade. If 25 of these students take art only, 18 take music only, and 9 do not take either art or music, how many take both art and music?
11. 010815a, P.I. A.RP.11
A school newspaper took a survey of 100 students. The results of the survey showed that 43 students are fans of the Buffalo Bills, 27 students are fans of the New York Jets, and 48 students do not like either team. How many of the students surveyed are fans of *both* the Buffalo Bills and the New York Jets?
[A] 18 [B] 52 [C] 16 [D] 70
12. 010434a, P.I. A.RP.11
A car dealer has 22 vehicles on his lot. If 8 of the vehicles are vans and 6 of the vehicles are red, and 10 vehicles are neither vans nor red, how many red vans does he have on his lot?
13. 060121a, P.I. A.RP.11
A school district offers hockey and basketball. The result of a survey of 300 students showed:
120 students play hockey, only
90 students play basketball, only
30 students do not participate in either sport
Of those surveyed, how many students play both hockey and basketball?
14. 080419a, P.I. A.RP.11
Seventy-eight students participate in one or more of three sports: baseball, tennis, and golf. Four students participate in all three sports; five play both baseball and golf, only; two play both tennis and golf, only; and three play both baseball and tennis, only. If seven students play only tennis and one plays only golf, what is the total number of students who play only baseball?
[A] 60 [B] 44 [C] 56 [D] 12
15. 080532a, P.I. A.RP.11
There are 30 students on a school bus. Of these students, 24 either play in the school band or sing in the chorus. Six of the students play in the school band but do not sing in the chorus. Fourteen of the students sing in the chorus and also play in the school band. How many students on the school bus sing in the chorus but do not play in the band?
16. 060732a, P.I. A.RP.11
Jose surveyed 20 of his friends to find out what equipment they use to play recorded movies. He found that 12 of his friends have only DVD players, 5 have both DVD players and VCRs, and 2 have neither type of player. The rest of his friends have only VCRs. What is the total number of his friends that have VCRs?
17. 010519a, P.I. A.RP.11
In Ms. Wright's English class, 16 students are in band, 7 students play sports, 3 students participate in both activities, and 9 students are not in band and do not play sports. How many students are in Ms. Wright's English class?
[A] 29 [B] 26 [C] 10 [D] 7

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[1] A _____

[2] C _____

[3] 84% and appropriate work is shown, such as mathematics or technology = 42, the total = 50, and the percentage = 84%.

[2] The correct numbers of students are shown, but the percentage is incorrect.

or [2] One error in computing the numbers of students is made, but the percentage is appropriate for those numbers.

[1] Only one number is correct, such as 28 taking mathematics.

or [1] An appropriate percentage is shown for two incorrect values.

or [1] 84% but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[3] incorrect procedure.

[4] C _____

[5] B _____

[6] C _____

[3] 50, and appropriate work is shown, such as a Venn diagram.

[2] Appropriate work is shown, but one computational error is made.

or [2] 200, and appropriate work is shown to find the number of students that have brown hair and/or brown eyes.

[1] Appropriate work is shown, but two or more computational errors are made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] The numbers of students who have brown hair only (40) and brown eyes only (70) are found, but no further correct work is shown.

or [1] 50, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[7] incorrect procedure.

[3] 33, and appropriate work is shown, such as a Venn diagram.

[2] Appropriate work is shown, but the number of households that purchased only Brand A and only Brand B is found, $22 + 35 = 57$.

or [2] Appropriate work is shown, but one computational error is made.

[1] A conceptual error is made, such as subtracting 87 from 100.

or [1] 33, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[8] incorrect procedure.

[2] 40, and appropriate work is shown, such as a Venn diagram or $(240 + 210) - 90 = 360$ and $400 - 360 = 40$.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 40, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[9] incorrect procedure.

[2] 8, and appropriate work is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 8, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[10] incorrect procedure.

[11] A

[2] 2, and appropriate work is shown, such as a Venn diagram, a listing, or an explanation.

[1] Appropriate work is shown, but one computational or conceptual error is made.

or [1] 2, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[12] incorrect procedure.

[2] 60, and appropriate work is shown, such as $300 - 120 - 90 - 30 = 60$.

or [2] 60, and an appropriate Venn diagram to illustrate the answer is shown.

[1] Appropriate work is shown, but one computational error is made.

or [1] An appropriate Venn diagram is drawn, and 240 is determined to be the total number of students given, but no further work is shown.

or [1] 60, but no work is shown.

[0] 240 is not subtracted from 300 and is given as the solution.

or [0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an

[13] obviously incorrect procedure.

[14] C

[2] 4, and appropriate work is shown, such as a Venn diagram.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 4, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[15] incorrect procedure.

[2] 6, and appropriate work is shown, such as a Venn diagram.

[1] Appropriate work is shown, but one computational error is made.

or [1] Appropriate work is shown, but one conceptual error is made.

or [1] 1, the number of friends with only a VCR player, is found, and appropriate work is shown.

or [1] 6, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously

[16] incorrect procedure.

[17] A
