

ИДЗ №1. Операции над множествами

Каждый студент выбирает вариант, соответствующий номеру в списке.

Задания небольшие, расписывать сочинения не нужно: всё должно быть кратко и точно. Домашнее задание нужно решить самостоятельно (!), оформить на ~~мае~~ чистом целом листочке и сдать не позднее *16 октября*.

Оценка «зачтено» ставится за верно выполненные все задания. В противном случае работа отправляется на доработку.

Успехов в первой домашней работе по математической логике! ☺

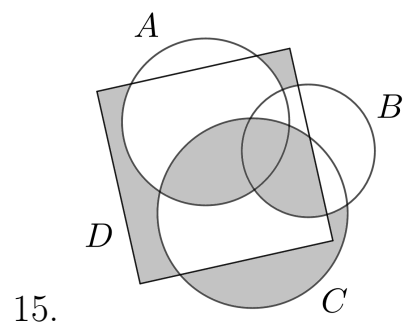
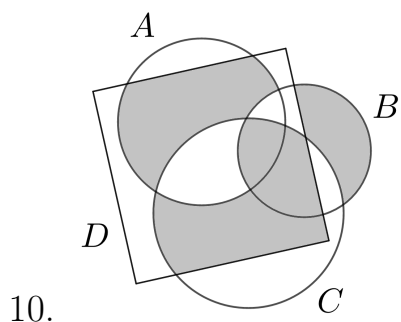
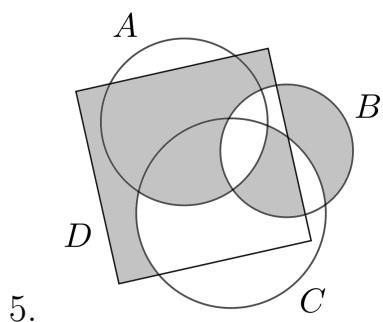
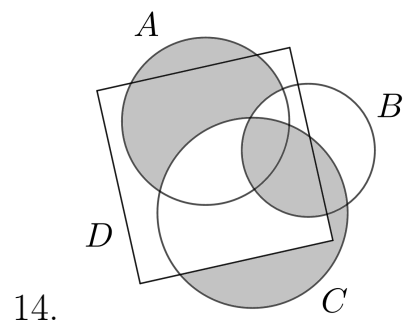
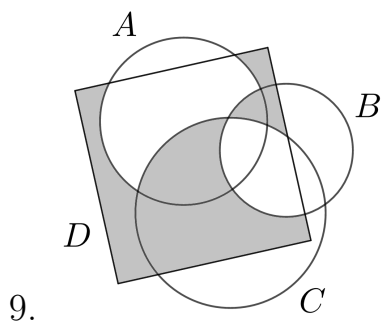
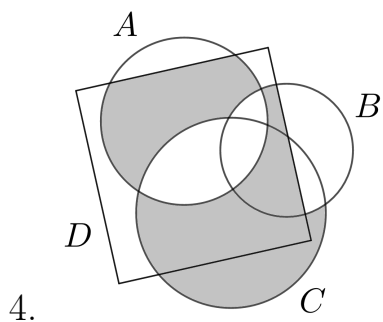
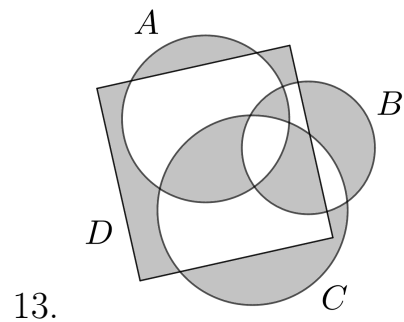
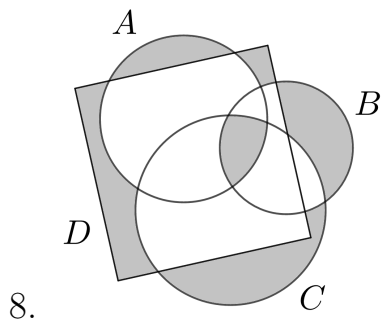
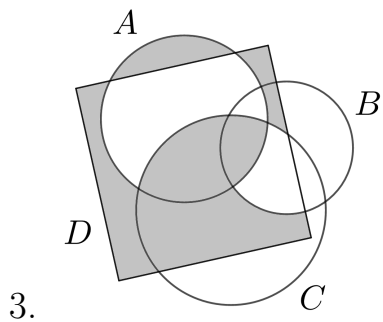
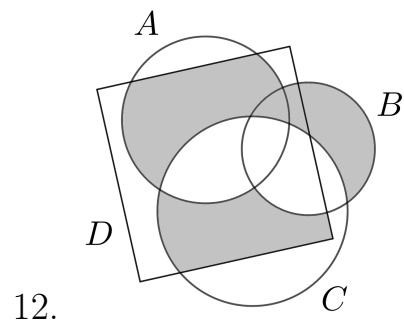
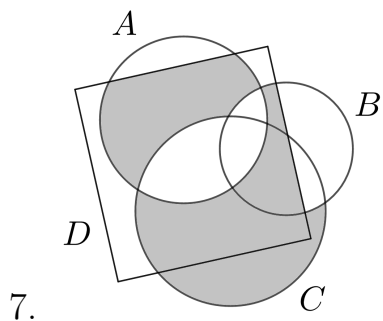
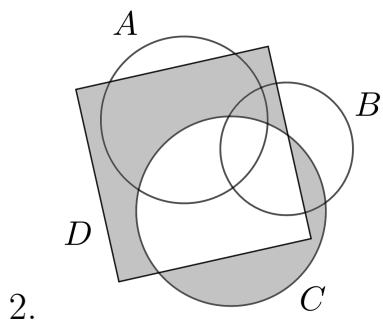
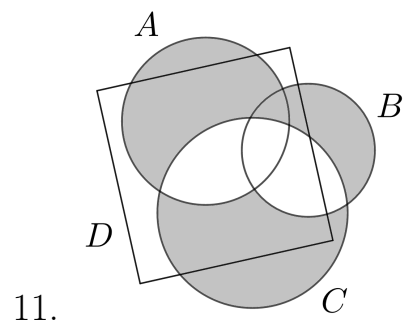
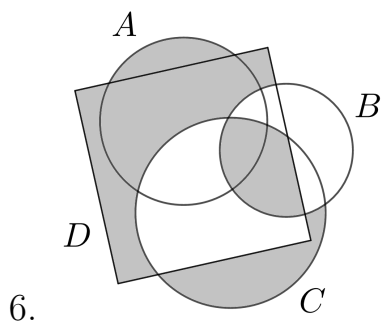
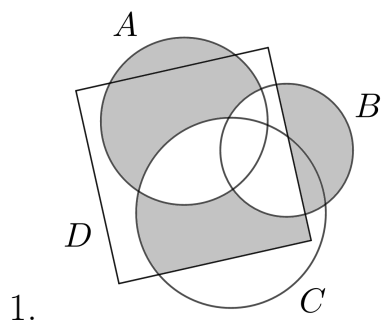
Варианты

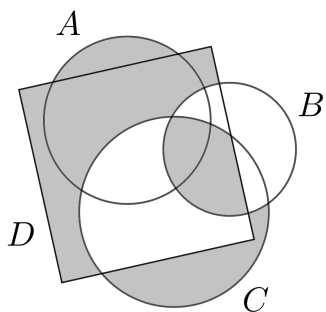
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| 2. Абрамов Ян | 19. Дмитриенко Макар |
| 3. Акимов Савва | 20. Долгоруков Даниил |
| 4. Акперов Эльнур | 21. Дронов Вадим |
| 5. Апухтин Илья | 22. Думич Кира |
| 6. Архипчук Михаил | 23. Егоров Артем |
| 7. Беркутов Михаил | 24. Ельчанинов Андрей |
| 8. Бижанова Алина | 25. Желобцов Сандал |
| 9. Бойчук Егор | 26. Жизнев Вадим |
| 10. Васильев Леонид | 27. Жуков Никита |
| 11. Власова Валерия | 28. Захаркин Павел |
| 12. Войтик Никита | 29. Земсков Иван |
| 13. Волошинский Ростислав | 30. Зиновьева Вера |
| 14. Гилев Антон | 31. Зотов Владимир |
| 15. Гмарь Кирилл | 32. Зубов Иван |
| 16. Гнатенко Андрей | 33. Иванов Леонид |
| 17. Гриценко Никита | 34. Иванова Анастасия |

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| 36. Ильин Кирилл | 61. Манжелей Никита |
| 37. Ильин Эдуард | 62. Мельничук Алиса |
| 38. Исаев Никита | 63. Найдовская Любовь |
| 39. Калитин Никита | 64. Николаев Чагыл |
| 40. Калюшко Алексей | 65. Николенко Артем |
| 41. Карпенко Даниил | 66. Нимаосоров Тамир |
| 42. Ким Денис | 67. Онищенко Александр |
| 43. Ким Леон | 68. Павлов Иван |
| 44. Ковалёв Игнат | 69. Павлова Диана |
| 45. Кожевников Роман | 70. Панов Илья |
| 46. Козлова Кристина | 71. Панухник Арсений |
| 47. Колван Лев | 72. Папчук Елизавета |
| 48. Колобенков Владислав | 73. Подпругин Никита |
| 49. Комаров Даниил | 74. Пожидаев Дмитрий |
| 50. Кон Владислав | 75. Полулях Андрей |
| 51. Коряковцев Максим | 76. Поляков Святозар |
| 52. Кочегуров Данил | 77. Портнова Лидия |
| 53. Кошевой Павел | 78. Привалов Максим |
| 54. Кругляк Фёдор | 79. Проскуренко Тимофей |
| 55. Кузина Екатерина | 80. Рапанович Александра |
| 56. Кулеш Алексей | 81. Рякин Ярослав |
| 57. Лебедев Арсений | 82. Саватеев Денис |
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| 59. Лопатин Валерий | 84. Серёдкина Виктория |

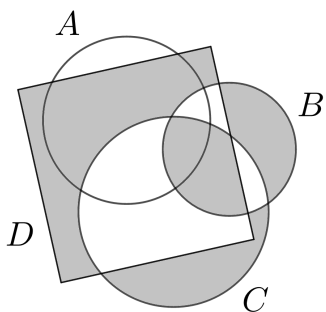
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| 87. Стафиевская София | 103. Христенко Ярослав |
| 88. Степачёв Родион | 104. Цветков Алексей |
| 89. Субачева Мария | 105. Цыбенова Сарюна |
| 90. Сяськин Никита | 106. Чекин Никита |
| 91. Тарабукин Александр | 107. Чернышев Вячеслав |
| 92. Твердохлебов Данил | 108. Чуев Александр |
| 93. Тимкин Данила | 109. Чусов Иван |
| 94. Ткачев Андрей | 110. Шахматов Александр |
| 95. Толочек Светлана | 111. Шестаков Иван |
| 96. Троянов Михаил | 112. Шехоркин Вадим |
| 97. Угринович Сергей | 113. Шурыгин Денис |
| 98. Умрилов Егор | 114. Щуров Денис |
| 99. Фарухшин Ринат | 115. Юрьев Артём |
| 100. Федосейкин Никита | |

Задание №1. Выразите закрашенную часть через множества A , B , C и D , используя операции $\cap$, $\cup$, $\setminus$:

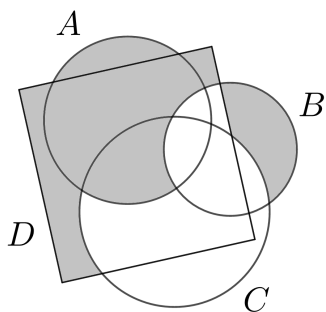




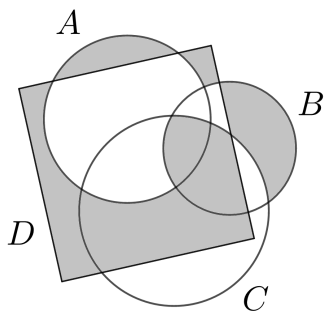
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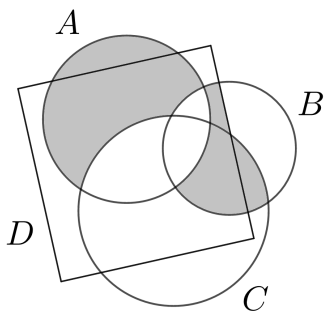
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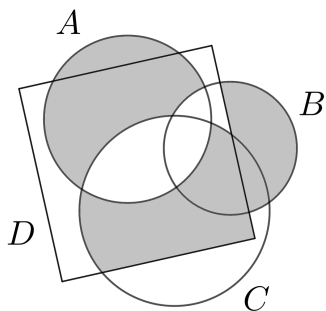
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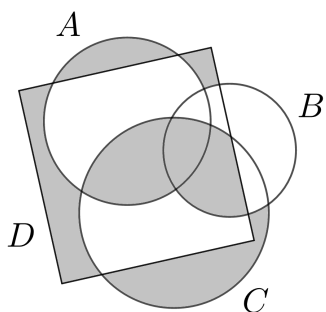
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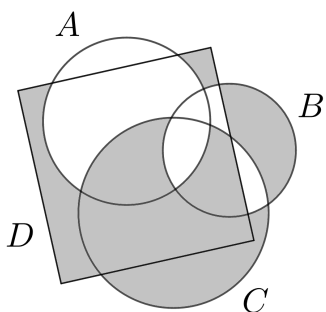
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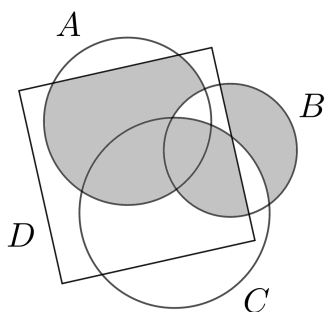
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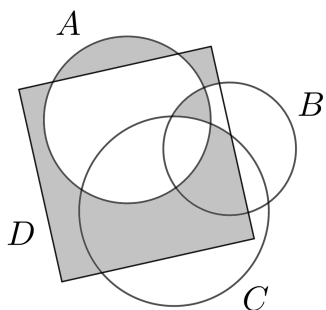
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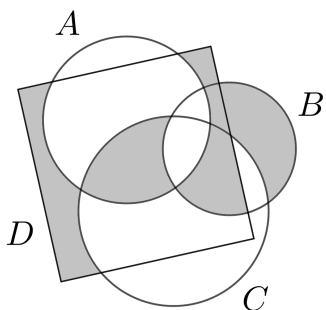
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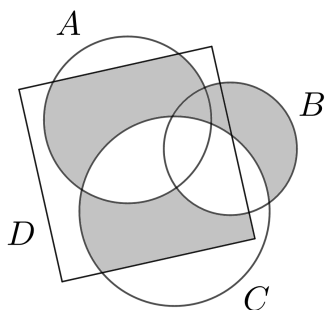
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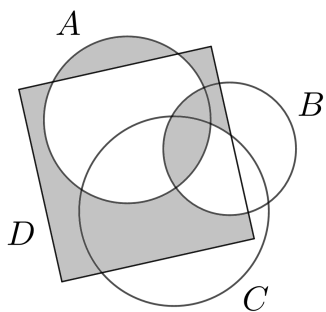
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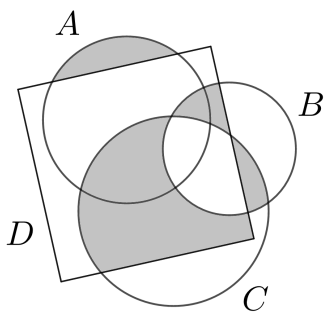
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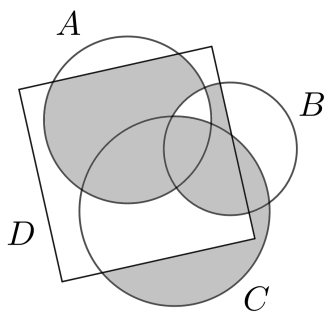
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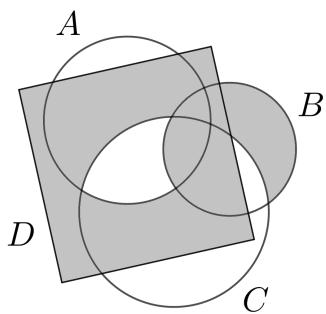
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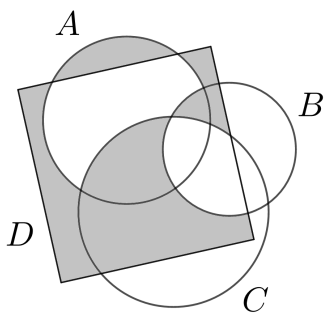
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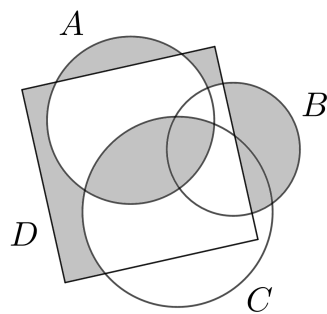
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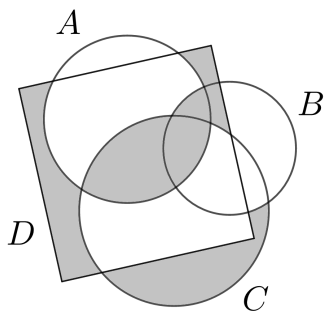
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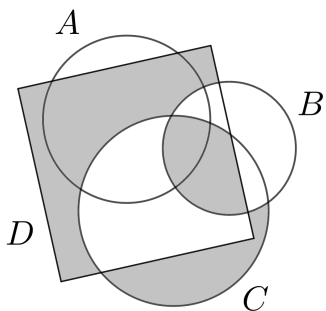
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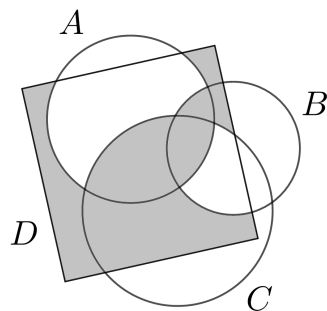
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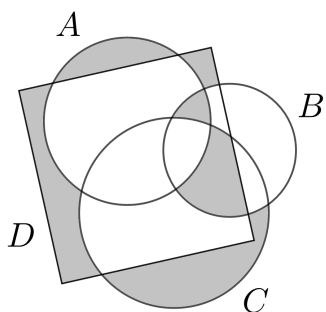
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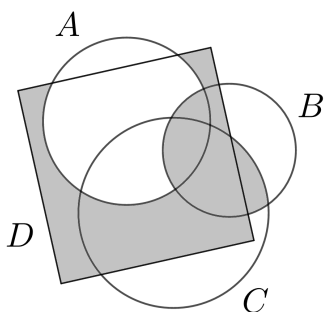
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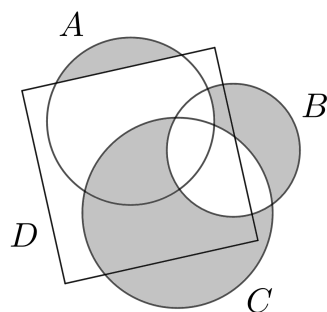
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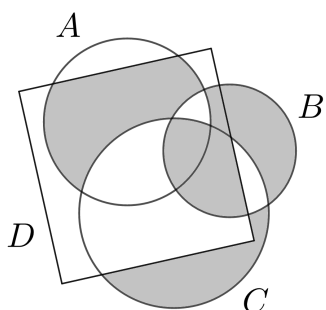
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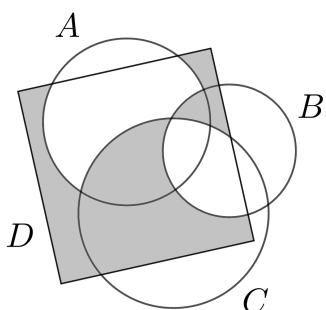
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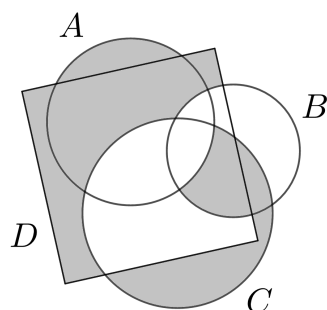
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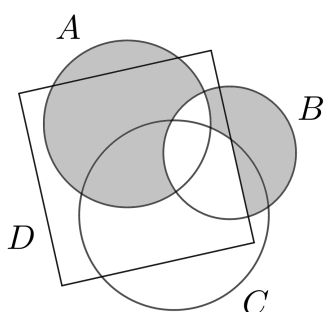
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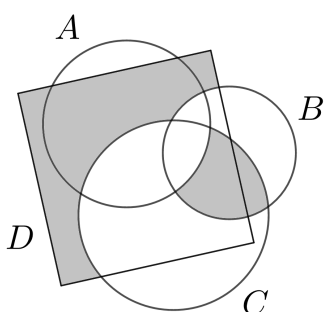
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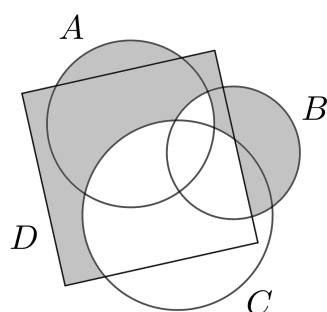
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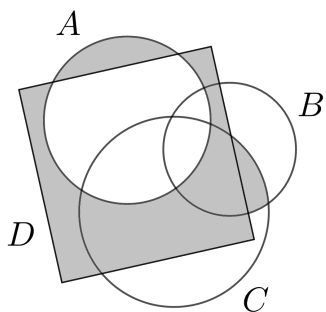
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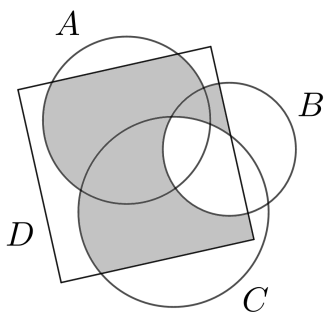
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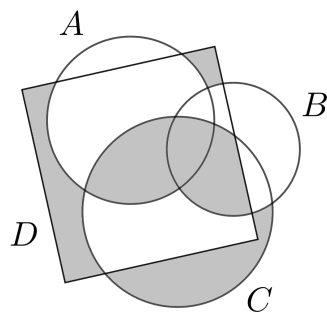
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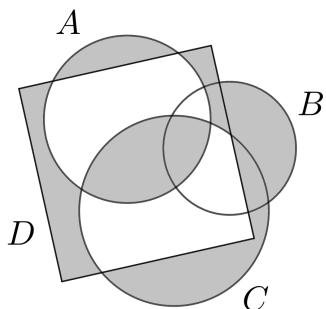
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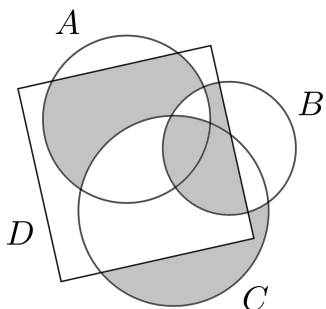
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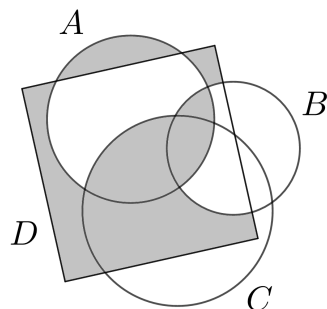
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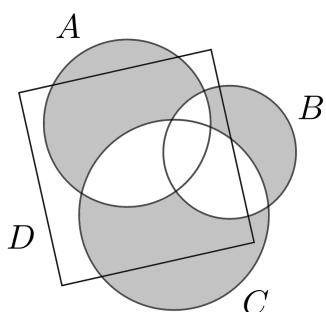
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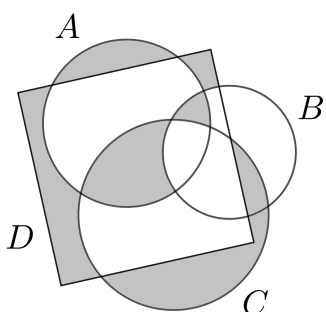
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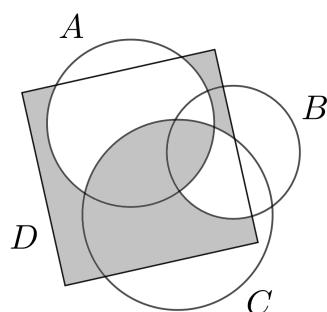
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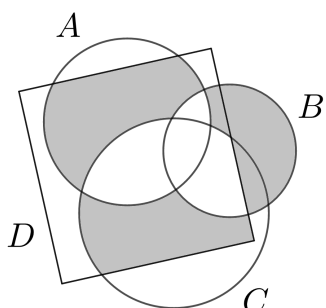
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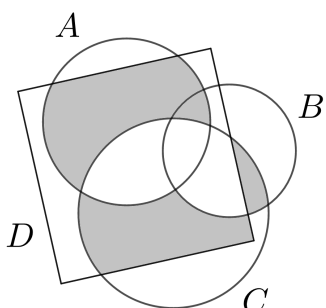
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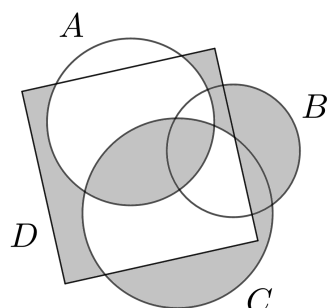
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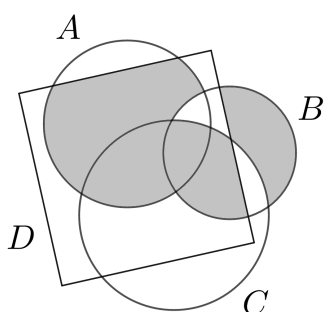
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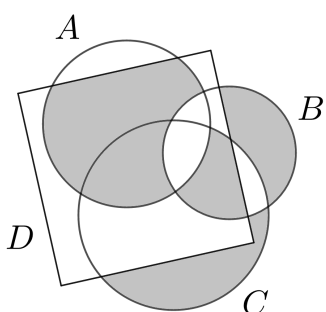
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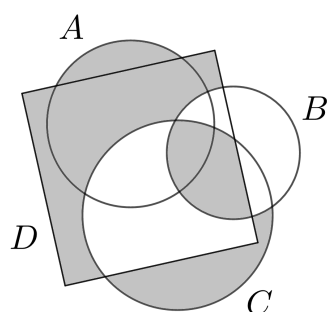
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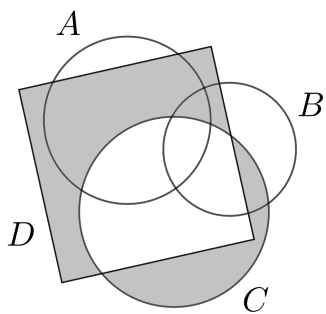
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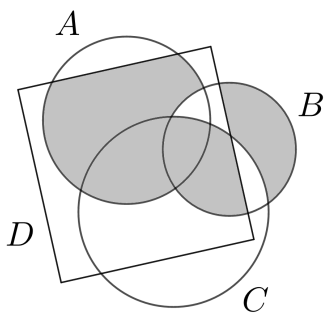
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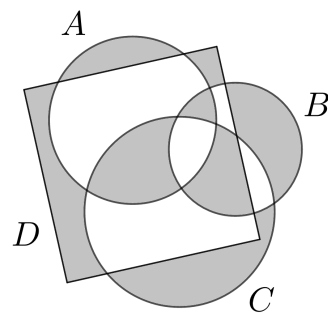
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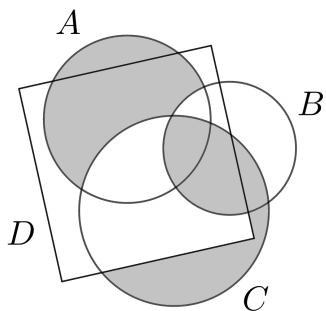
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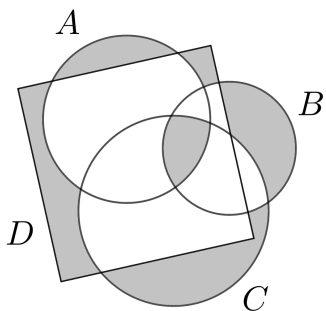
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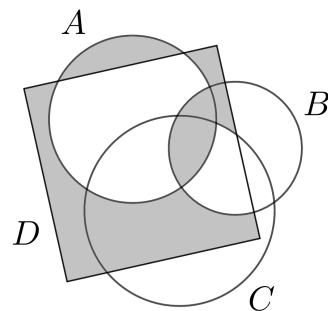
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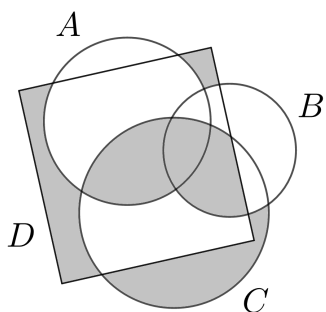
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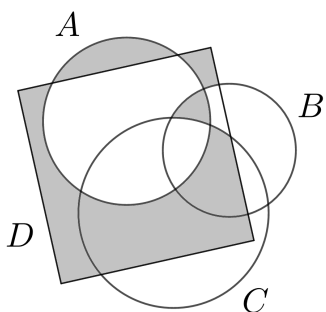
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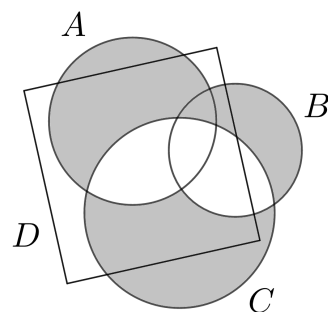
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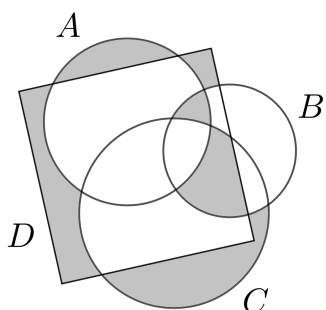
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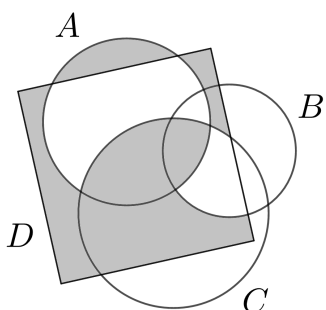
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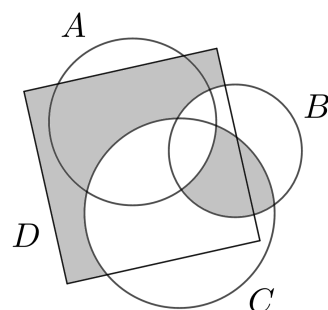
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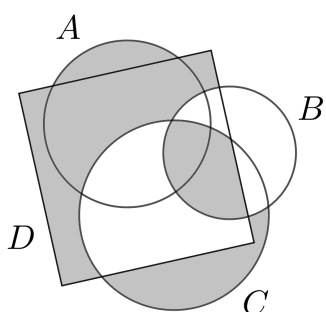
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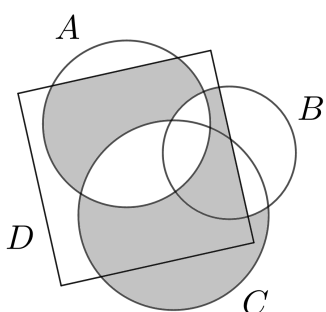
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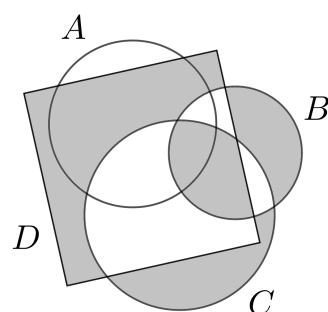
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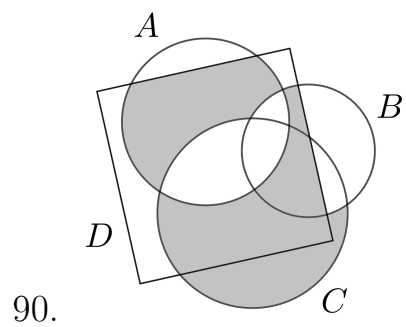
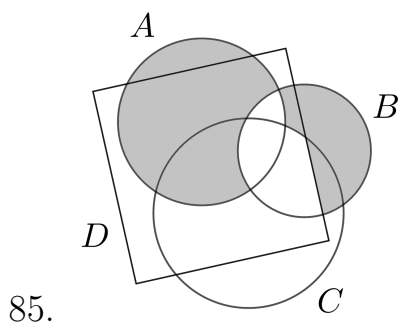
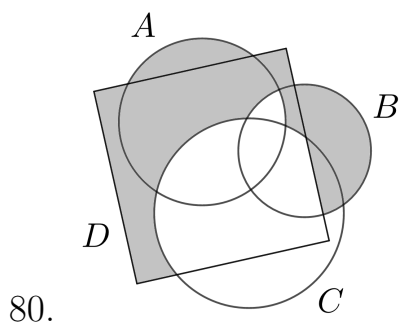
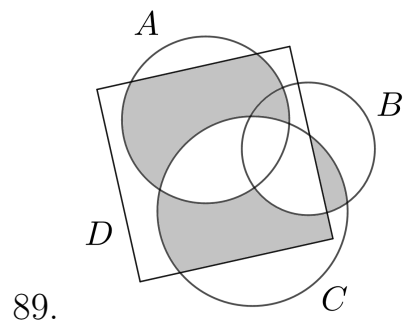
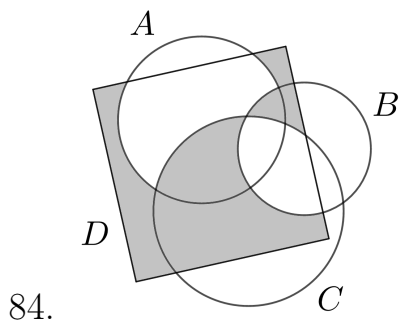
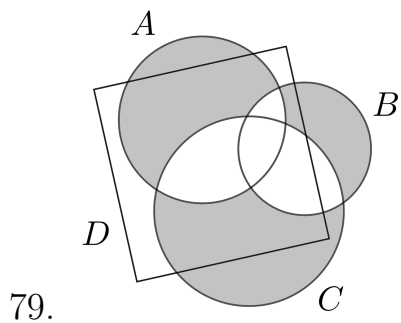
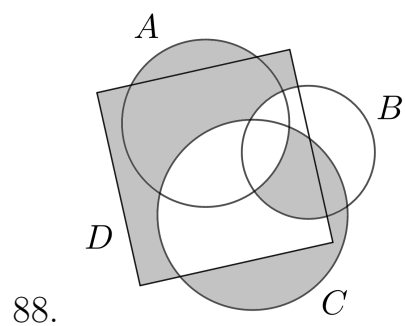
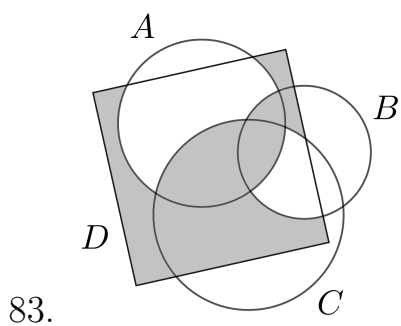
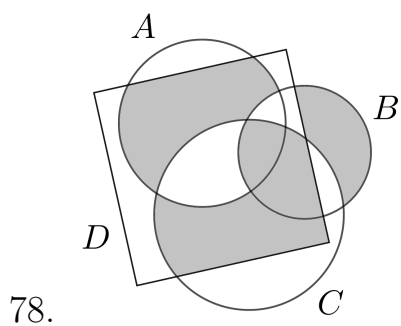
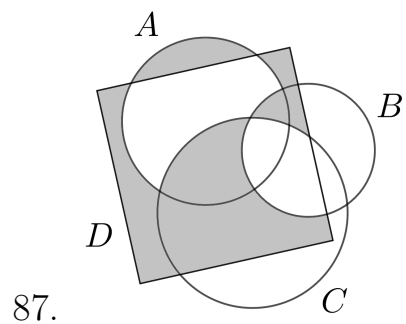
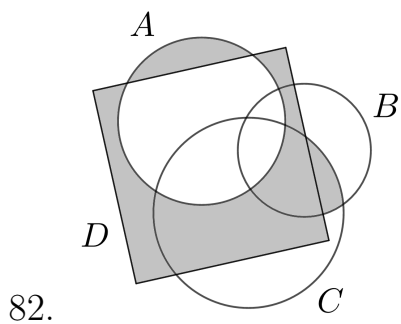
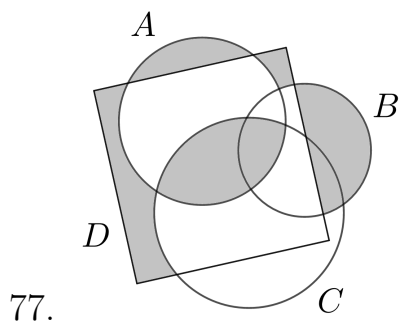
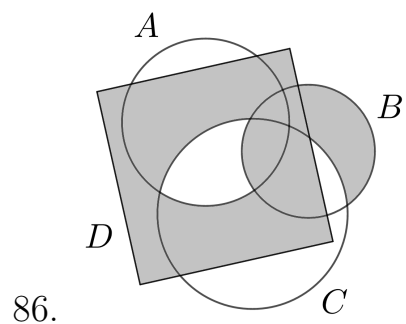
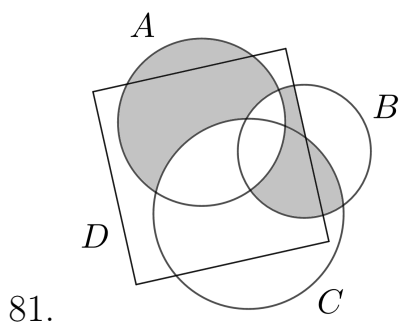
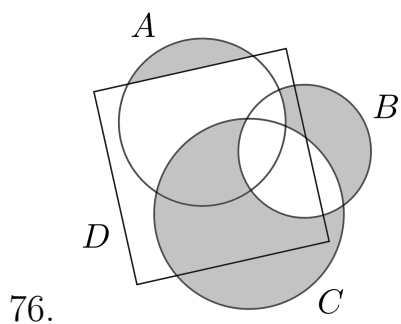
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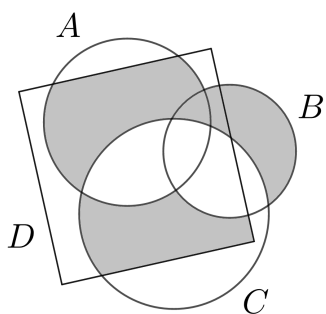


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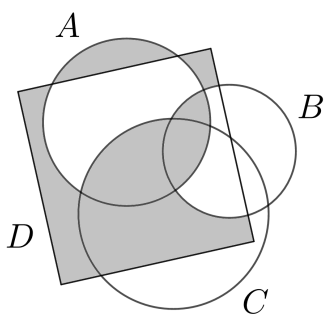


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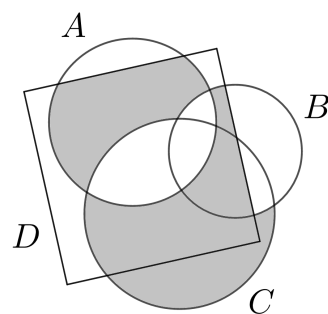




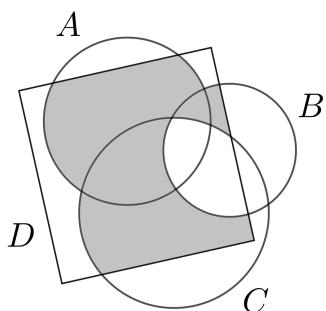
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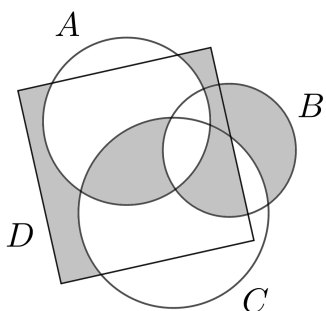
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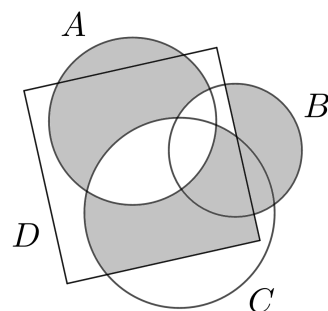
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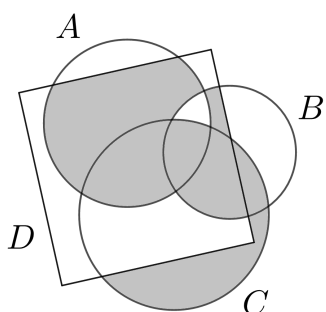
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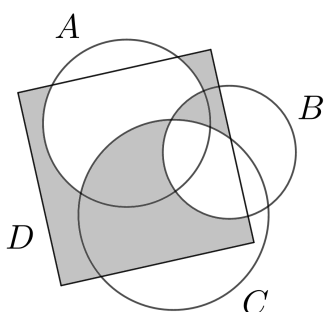
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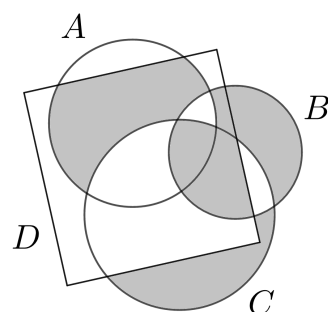
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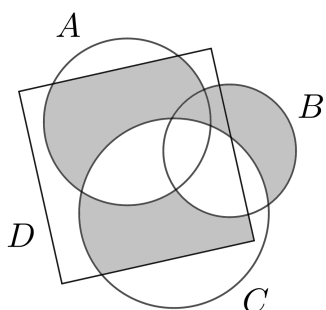
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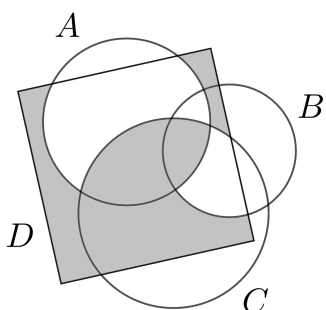
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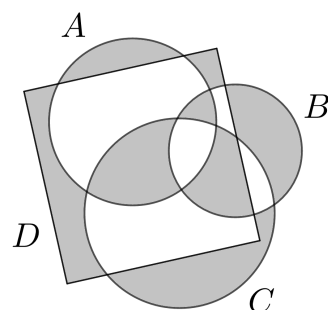
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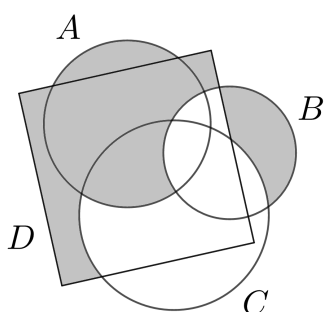
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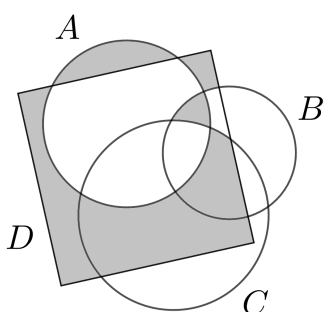
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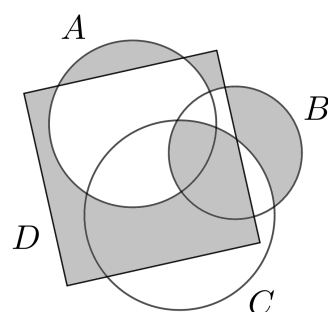
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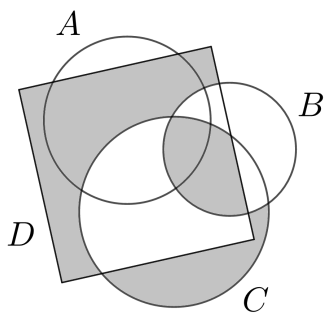
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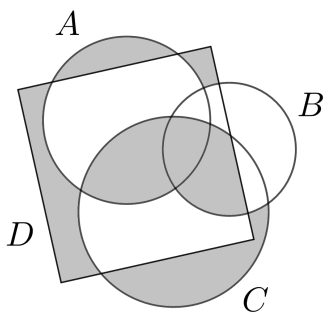
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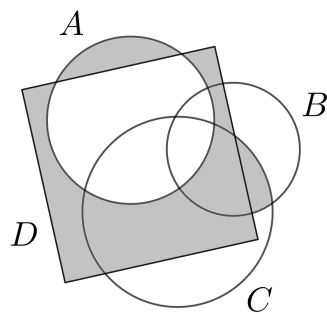
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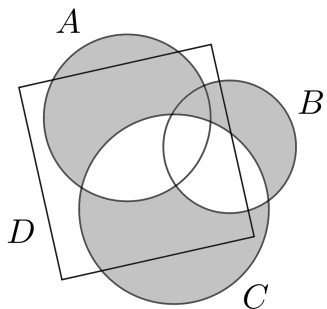
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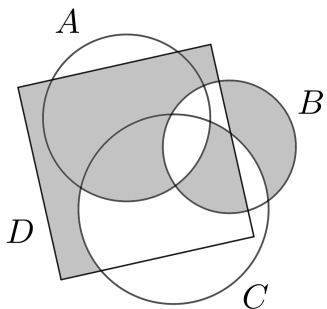
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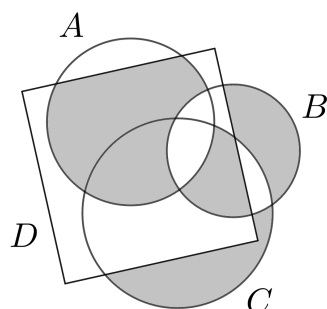
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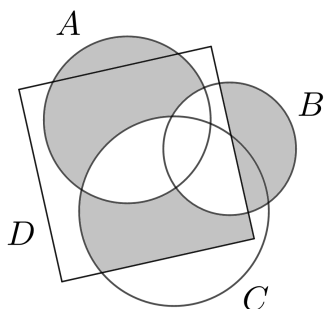
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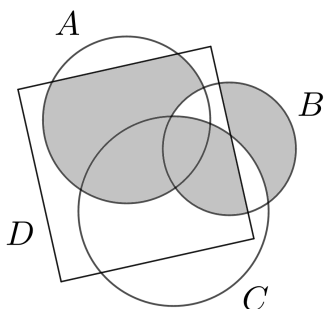
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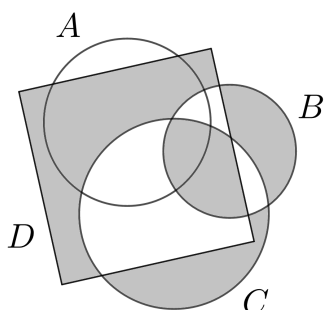
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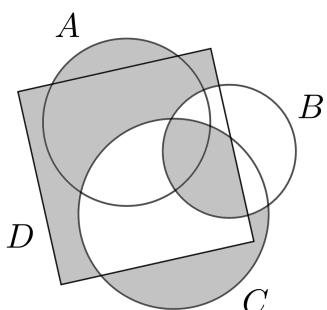
108.



112.



109.



113.

Задание №2. Докажите

- по определению,
- методом от противного.

1. $A \cap (B \setminus C) = (A \cap B) \setminus C$.
2. $(A \cap B) \setminus (A \cap C) = (A \cap B) \setminus C$.
3. $A \cap B \subseteq C \Rightarrow B \setminus C \subseteq A \Delta B$.
4. $(A \cup B) \setminus (A \cap B) = (A \cap \overline{B}) \cup (\overline{A} \cap B)$.
5. $B \subseteq A \Rightarrow (A \setminus B) \cup B = A$.
6. $A \subseteq B \Rightarrow A \cap C \subseteq B \cap C$.
7. $A \subseteq B \Rightarrow A \setminus C \subseteq B \setminus C$.
8. $A = \emptyset \Rightarrow A \setminus B = A \cap B$.
9. $\overline{A} \cup B = U \Leftrightarrow A \setminus B = \emptyset$.
10. $(A \cup B) \setminus (A \cap B) = (A \setminus B) \cup (B \setminus A)$.
11. $A \cap B = \emptyset \Rightarrow A \cup B = A \Delta B$.
12. $A \subseteq B \Delta C \Rightarrow B \cap C \subseteq B \setminus A$.
13. $A \Delta B \subseteq C \Rightarrow A \setminus C \subseteq A \cap B$.
14. $C \subseteq A$ и $C \subseteq B \Rightarrow C \subseteq A \cap B$.
15. $A \setminus (B \setminus C) = (A \setminus B) \cup (A \cap C)$.
16. $A \cup B = A \setminus B \Rightarrow B = \emptyset$.
17. $A \cap B = \emptyset \Leftrightarrow B \subseteq \overline{A}$.
18. $(A \setminus B) \setminus C = (A \setminus C) \setminus (B \setminus C)$.
19. $A \cup B = U \Leftrightarrow \overline{A} \subseteq B$.
20. $A \cup B = U \Leftrightarrow \overline{B} \subseteq A$.
21. $A \cap \overline{B} \subseteq C \Rightarrow A \subseteq B \cup C$.
22. $A \subseteq C$ и $B \subseteq C \Rightarrow A \cup B \subseteq C$.
23. $A \subset B$ и $B \subseteq C \Rightarrow A \subset C$.
24. $\overline{A} \subseteq B \Leftrightarrow \overline{B} \subseteq A$.
25. $B = \emptyset \Rightarrow A \cup B = A \setminus B$.
26. $C \subseteq A \cap B \Rightarrow C \subseteq A$ и $C \subseteq B$.
27. $A \cap B \subseteq \overline{C}$ и $A \cup C \subseteq B \Rightarrow A \cap C = \emptyset$.
28. $A \cap B \subseteq C \Rightarrow A \Delta C \subseteq \overline{B \setminus C}$.
29. $B \cap (A \setminus B) = \emptyset$.
30. $A \cup B = B \cap C \Rightarrow A \subseteq B \subseteq C$.
31. $A \subseteq B \cup C \Rightarrow A \setminus B \subseteq C \Delta B$.
32. $A \setminus (A \cap B) = A \setminus B$.
33. $A \cap B = \emptyset \Rightarrow (A \cup B) \setminus B = A$.
34. $A \cap B \subseteq C \Rightarrow A \subseteq \overline{B} \cup C$.
35. $A \subseteq C \Rightarrow A \cup (B \cap C) = (A \cup B) \cap C$.
36. $A = B \cup C \Rightarrow A \setminus B \subseteq C$.
37. $A \Delta B = C \Rightarrow B \Delta C = A$.
38. $\overline{A \setminus B} = \overline{A} \cup (A \cap B)$.
39. $A \subseteq \overline{B} \Leftrightarrow B \subseteq \overline{A}$.
40. $B \subseteq A$ и $C = A \setminus B \Rightarrow A = B \cup C$.
41. $B \cup (A \setminus B) = A \cup B$.
42. $A \subseteq B \Leftrightarrow \overline{B} \subseteq \overline{A}$.
43. $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$.
44. $A \cup B \subseteq C \Rightarrow A \subseteq C$ и $B \subseteq C$.

45. $A \subseteq \overline{B} \cup C \Rightarrow A \cap B \subseteq C$.
46. $B \cap C = \emptyset$ и $A \cap C \neq \emptyset \Rightarrow A \setminus B \neq \emptyset$.
47. $C = A \setminus B \Rightarrow B \cap C = \emptyset$.
48. $A \setminus B = A \Leftrightarrow B \setminus A = B$.
49. $A \cap (B \setminus C) = (A \cap B) \setminus (A \cap C)$.
50. $A \subseteq B \Rightarrow C \setminus B \subseteq C \setminus A$.
51. $A \setminus B = A \cap B \Rightarrow A = \emptyset$.
52. $A \subseteq B \subseteq C \Rightarrow A \cup B = B \cap C$.
53. $A \setminus (A \setminus B) = A \cap B$.
54. $A \setminus (B \cap C) = (A \setminus B) \cup (A \setminus C)$.
55. $A \subseteq B \cup C \Rightarrow A \cap \overline{B} \subseteq C$.
56. $A \subseteq B \Rightarrow A \cup C \subseteq B \cup C$.
57. $A \cap B = \emptyset \Leftrightarrow A \subseteq \overline{B}$.
58. $A \Delta B \subseteq C \Rightarrow A \setminus C \subseteq A \cap B$.
59. $A \subset B$ и $B \subseteq C \Rightarrow A \subset C$.
60. $A \setminus (B \setminus C) = (A \setminus B) \cup (A \cap C)$.
61. $(A \cup B) \setminus (A \cap B) = (A \setminus B) \cup (B \setminus A)$.
62. $A \cap B \subseteq C \Rightarrow A \Delta C \subseteq \overline{B \setminus C}$.
63. $A \subseteq B \Delta C \Rightarrow B \cap C \subseteq B \setminus A$.
64. $A = \emptyset \Rightarrow A \setminus B = A \cap B$.
65. $A \cap \overline{B} \subseteq C \Rightarrow A \subseteq B \cup C$.
66. $A \setminus (A \cap B) = A \setminus B$.
67. $C \subseteq A$ и $C \subseteq B \Rightarrow C \subseteq A \cap B$.
68. $A \cup B = U \Leftrightarrow \overline{A} \subseteq B$.
69. $(A \setminus B) \setminus C = (A \setminus C) \setminus (B \setminus C)$.
70. $\overline{A} \subseteq B \Leftrightarrow \overline{B} \subseteq A$.
71. $A \subseteq B \Rightarrow A \setminus C \subseteq B \setminus C$.
72. $(A \cap B) \setminus (A \cap C) = (A \cap B) \setminus C$.
73. $A \subseteq C$ и $B \subseteq C \Rightarrow A \cup B \subseteq C$.
74. $A \subseteq B \cup C \Rightarrow A \setminus B \subseteq C \Delta B$.
75. $A \cup B = U \Leftrightarrow \overline{B} \subseteq A$.
76. $B \subseteq A$ и $C = A \setminus B \Rightarrow A = B \cup C$.
77. $A \subseteq \overline{B} \Leftrightarrow B \subseteq \overline{A}$.
78. $A \cap B = \emptyset \Leftrightarrow B \subseteq \overline{A}$.
79. $B \subseteq A \Rightarrow (A \setminus B) \cup B = A$.
80. $A \cap B \subseteq C \Rightarrow B \setminus C \subseteq A \Delta B$.
81. $A \cap (B \setminus C) = (A \cap B) \setminus (A \cap C)$.
82. $A \subseteq B \Rightarrow C \setminus B \subseteq C \setminus A$.
83. $A \cap B = \emptyset \Rightarrow A \cup B = A \Delta B$.
84. $A \subseteq B \Leftrightarrow \overline{B} \subseteq \overline{A}$.
85. $(A \cup B) \setminus (A \cap B) = (A \cap \overline{B}) \cup (\overline{A} \cap B)$.
86. $A \subseteq \overline{B} \cup C \Rightarrow A \cap B \subseteq C$.
87. $B \cup (A \setminus B) = A \cup B$.
88. $B = \emptyset \Rightarrow A \cup B = A \setminus B$.
89. $A \setminus (B \cup C) = (A \setminus B) \cap (A \setminus C)$.
90. $A \subseteq B \Rightarrow A \cap C \subseteq B \cap C$.
91. $A \subseteq B \cup C \Rightarrow A \cap \overline{B} \subseteq C$.
92. $C \subseteq A \cap B \Rightarrow C \subseteq A$ и $C \subseteq B$.
93. $A \cap B \subseteq \overline{C}$ и $A \cup C \subseteq B \Rightarrow A \cap C = \emptyset$.
94. $A \Delta B \subseteq C \Rightarrow A \setminus C \subseteq A \cap B$.

95. $A \setminus (B \setminus C) = (A \setminus B) \cup (A \cap C)$. 106. $(A \cup B) \setminus (A \cap B) = (A \setminus B) \cup (B \setminus A)$.
96. $A \cap B = \emptyset \Rightarrow (A \cup B) \setminus B = A$. 107. $A \setminus B = A \cap B \Rightarrow A = \emptyset$.
97. $A \setminus (B \cap C) = (A \setminus B) \cup (A \setminus C)$. 108. $\overline{A \setminus B} = \overline{A} \cup (A \cap B)$.
98. $B \cap C = \emptyset$ и $A \cap C \neq \emptyset \Rightarrow A \setminus B \neq \emptyset$. 109. $(A \cap B) \setminus (A \cap C) = (A \cap B) \setminus C$.
99. $A \cup B = U \Leftrightarrow \overline{A} \subseteq B$. 110. $A \cup B = A \setminus B \Rightarrow B = \emptyset$.
100. $A \subseteq C \Rightarrow A \cup (B \cap C) = (A \cup B) \cap C$. 111. $A \subseteq B \subseteq C \Rightarrow A \cup B = B \cap C$.
101. $A \setminus (A \cap B) = A \setminus B$. 112. $A \cap (B \setminus C) = (A \cap B) \setminus (A \cap C)$.
102. $A \cup B = B \cap C \Rightarrow A \subseteq B \subseteq C$. 113. $B \subseteq A$ и $C = A \setminus B \Rightarrow A = B \cup C$.
103. $A \cup B \subseteq C \Rightarrow A \subseteq C$ и $B \subseteq C$. 114. $\overline{A} \subseteq B \Leftrightarrow \overline{B} \subseteq A$.
104. $A \cap B \subseteq C \Rightarrow A \subseteq \overline{B} \cup C$. 115. $(A \setminus B) \setminus C = (A \setminus C) \setminus (B \setminus C)$.
105. $C = A \setminus B \Rightarrow B \cap C = \emptyset$.