LESSON MAKER PRO

Set Operation Lab

Practice set rules, real choices, and ordered pairs.

HIGH SCHOOL · MA.912.LT.5.4

MA.912.LT.5.4 "Perform the set operations of taking the complement of a set and the union, intersection, difference and product of two sets."

NAME _____ DATE _____

SET OPERATION RULES

The complement A' contains the elements in the universal set U that are not in A. The union contains elements in either set, the intersection contains elements in both sets, and A-B contains elements in A but not B. The product A x B is a set of ordered pairs, with the first element from A and the second element from B.

WORKED EXAMPLE

Let U={p,q,r,s,t}, C={p,r}, and D={r,s}. Find C', C intersect D, and C x D.

1. Remove C from U: C'={q,s,t}.
2. Keep the elements shared by C and D: C intersect D={r}.
3. Pair each element of C with each element of D: C x D={(p,r),(p,s),(r,r),(r,s)}.

Answer: C'={q,s,t}; C intersect D={r}; C x D={(p,r),(p,s),(r,r),(r,s)}

PRACTICE 6 problems

1 Let U={1,2,3,4,5,6,7,8} and J={2,4,7}. Find J'.

ANSWER _____

2 Let A={1,4,6} and B={2,4,5}. Find A union B.

ANSWER _____

3 Let H={0,2,5,7} and K={2,3,5,9}. Find H intersect K.

ANSWER _____

4 Let R={1,3,4,8} and S={3,6,8}. Find R-S.

ANSWER _____

5 Let M={2,5} and N={a,b,c}. Find M x N.

ANSWER _____

6 Let U={1,2,3,4,5,6,7,8,9,10}, P={1,2,4,7}, and Q={2,3,7,8}. Find (P union Q)'.

ANSWER _____

APPLY IT Show your work

1 A school media club has 30 members. Twelve members edit videos, 15 members produce podcasts, and 5 members do both. How many members do neither activity?

WORK SPACE

ANSWER _____

2 Riley is choosing a game profile with one background from A={forest,city,space} and one badge color from B={red,blue}. List A x B and state how many profiles are possible.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Let U={1,2,3,4,5,6,7,8,9}, A={1,2,4,6,9}, B={2,3,4,7}, and C={1,3,5,7,8}. Find (A-B) x (B' intersect C).

WORK SPACE AND ANSWER

ANSWER KEY

Set Operation Lab

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Let U={1,2,3,4,5,6,7,8} and J={2,4,7}. Find J'.	**{1,3,5,6,8}**
2	Let A={1,4,6} and B={2,4,5}. Find A union B.	**{1,2,4,5,6}**
3	Let H={0,2,5,7} and K={2,3,5,9}. Find H intersect K.	**{2,5}**
4	Let R={1,3,4,8} and S={3,6,8}. Find R-S.	**{1,4}**
5	Let M={2,5} and N={a,b,c}. Find M x N.	**{(2,a),(2,b),(2,c),(5,a),(5,b),(5,c)}**
6	Let U={1,2,3,4,5,6,7,8,9,10}, P={1,2,4,7}, and Q={2,3,7,8}. Find (P union Q)'.	**{5,6,9,10}**

PART 2 · APPLY IT

1. **8 students** The number in at least one group is 12+15-5=22. The complement has 30-22=8 students.
2. **{(forest,red),(forest,blue),(city,red),(city,blue),(space,red),(space,blue)}; 6 profiles** Form an ordered pair with a background first and a badge color second. There are 3 x 2=6 possible pairs.

CHALLENGE

{(1,1),(1,5),(1,8),(6,1),(6,5),(6,8),(9,1),(9,5),(9,8)}

Accept set elements in any order. For products, require ordered pairs with the first entry from the first set and the second entry from the second set.