1. A,V$\subset$ M ={1, … , 20} to'plamlar uchun quyidagilarni aniqlang:

A \ V, V \ A , A $\cup$ V, A $\cap$ V, A′, V′. A={1,3,5,7,9}, B={2,4,7,8}.

Yechish: Berilgan to'plamlar uchun to'plamlar ustida bajariladigan amallarning ta'riflarini qo'llab quyidagi to'plamlarni hosil qilamiz:

A \ B={1,3,5,9};   B \ A={2,4,8};   A $\cup$ V={1,2,3,4,5,7,8,9};

A$\cap$ V={7};   A′={2,4,6,8,10,11,12,13,14,15,16,17,18,19,20};

V′={1,3,5,6,9,10,11,12,13,14,15,16,17,18,19,20}.

2. (A$\cup$V)\S=(A\S)$\cup$(V\S) tenglikni isbotlang.
To'plamlarning tengligini isbotlash uchun M=N$\Leftrightarrow$ M $\subset$ N$\wedge$N $\subset$ M tasdiqdan foydalanamiz.

1) $\forall$x$\in$((A$\cup$ V)\S) $\Rightarrow$ x$\in$(A$\cup$V) $\wedge$ x$\notin$S$\Rightarrow$ x$\in$A $\vee$ x$\in$V$\wedge$ x$\notin$S$\Rightarrow$

$\Rightarrow$ (x$\in$A $\wedge$ x$\notin$S) $\vee$ (x$\in$V$\wedge$ x$\notin$S) $\Rightarrow$ x$\in$(A\S) $\vee$ x$\in$(V\S) $\Rightarrow$

$\Rightarrow$ x$\in$((A \S) $\cup$(V\S)). Bundan (A $\cup$ V) \S$\subset$ (A \S) $\cup$(V\S) ekanligi kelib chiqadi.

2) $\forall$u$\in$((A \S) $\cup$(V\S)) $\Rightarrow$u$\in$(A\S) $\vee$u$\in$(V\S) $\Rightarrow$ (u$\in$A $\wedge$u$\notin$S) $\vee$

$\vee$ (u$\in$V$\wedge$u$\notin$S) $\Rightarrow$u$\in$A $\vee$u$\in$V$\wedge$u$\notin$S) $\Rightarrow$u$\in$(A $\cup$V) $\wedge$u$\notin$S$\Rightarrow$

$\Rightarrow$u$\in$((A $\cup$ V) \S). Bundan (A \S) $\cup$(V\S) $\subset$ (A $\cup$ V) \S ekanligi kelib chiqadi. Demak (A $\cup$V) \ S = (A \ S) $\cup$ (V \ S).

3)To'plamlar jufti berilgan:

a) A = {Navoiy, Bobur, Furqat, Nodirabegim} va B = barcha shoir va shoiralar to'plami;

b) C = qavariq to'rtburchaklar to'plami va D = to'rtburchaklar to'plami;

d) J = Samarqand olimlarito'plami, F = O'zbekiston olimlarito'plami;

e) K = barcha tub sonlarto'plami, M = manfiy sonlar to'plami.

Juftlikdagito'plamlardanqaysi bid ikkinchisiningqism-to'plamibo'lishinianiqlang.

4. Quyidagito'plamlaruchun $A \subset B$ yoki $B \subset A$ munosabatlardan qaysibiri o'rinli:

a) $A = \{a, b, c, d\}$, $B = \{a, c, d\}$;   b) $A = \{a, b\}$, $B = \{a, c, d\}$;   d) $A = \varnothing$, $B = \varnothing$;

e) $A = \varnothing$, $B = \{a, b, c\}$;   f) $A = \varnothing$, $B = \{\varnothing\}$;   g) $A = \{\{\varnothing\}, a, 0\}$, $B = \{a\}$;

h) $A = \{\{a, b\}, \{c, d\}\}$, $B = \{\{a, b\}, c\}$;   i) $A = \{\{0\}, 0\}$, $B = \{\varnothing, \{\{0\}, 0\}\}$?

5. Munosabatning to'g'ri yoki noto'g'ri ekanligini aniqlang:

    a) $\{1;\ 2\} \subset \{\{1;\ 2;\ 3\};\ \{1;\ 3\};\ 1;\ 2\}$;   b) $\{1;\ 2\} \in \{\{1;\ 2;\ 3\};\ \{1;\ 3\};\ 1;\ 2\}$;

    d) $\{1;\ 3\} \subset \{\{1;\ 2;\ 3\};\ \{1;\ 3\};\ 1;\ 2\}$;   e) $\{1;\ 3\} \in \{\{1;\ 2;\ 3\};\ \{1;\ 3\};\ 1;\ 2\}$.

6. Quyidagi to'plamlar tengmi?

    a) $A = \{1;\ 4;\ 6\}$ va $B = \{6;\ 4;\ 2\}$;   b) $A = \{1;\ 2;\ 3\}$ va $B = \{1;\ 11;\ 111\}$;

    d) $A = \{\{1;\ 2\};\ \{2;\ 3\}\}$ va $B = \{2;\ 3;\ 1\}$;   e) $A = \{\sqrt{256};\ \sqrt{81};\ \sqrt{16}\}$ va $B = \{2^2;\ 3^2;\ 4^2\}$.

7. $x = \{x \mid x^2 - 5x + 6 = 0\}$ va $A = \{2;\ 3\}$ to'plamlar haqida nima deyish mumkin?

8. $M = (36;\ 29;\ 15;\ 68;\ 27)$, $P = (4;\ 15;\ 27;\ 47;\ 36;\ 90)$, $Q = (90;\ 4;\ 47)$ to'plamlar berilgan. $M \cap P,\ M \cap Q,\ P \cap Q,\ M \cap P \cap Q$ larni toping?

9. A-18 ning hamma natural bo'luvchilari to'plami, B-24 ning hamma natural bo'luvchilari to'plami. $A \cap B$ to'plam elementlarini ko'rsating?

10. P ikki xonali natural sonlar to'plami, S barcha toq natural sonlar to'plami bo'lsa, $K = P \cup S$ to'plamga qaysi sonlar kiradi?

    a) $21 \in K$;   b) $32 \in K$;   d) $7 \notin K$;   e) $17 \notin K$ deyish to'g'rimi?

11. "Matematika" va "grammatika" so'zlaridagi harflar to'plamini tuzing. Bu to'plamlar kesishmasini toping?

12. $[1,\ 5]$ va $[3,\ 7]$ kesmalarning kesishmasini toping?

13. $P = \{a,\ b,\ c,\ d,\ e,\ f\}$ va $J = \{a,\ g,\ z,\ e,\ k\}$ to'plamlar birlashmasini toping?

14. $A = \{n \mid n \in N,\ n < 5\}$ va $B = \{n \mid n \in N,\ n > 7\}$ to'plamlar birlashmasini toping?

    a) $4 \in A \cup B$;   b) $-3 \in A \cup B$;   d) $6 \in 4 \cup 5$ deyish to'g'rimi?

15. $A = \{2,\ 4,\ 6,\ ...,\ 40\}$, $B = \{1,\ 3,\ 5,\ ...,\ 37\}$, $C = \{\{a,\ b\},\ \{c,\ d\},\ \{e,\ f\},\ g,\ h\}$ to'plamlarning har biridagi elementlar sonini aniqlang. $A \cup B$ da nechta element mavjud?

16. $A = \{2,\ 3,\ 4,\ 5,\ 7,\ 10\}$, $B = \{3,\ 5,\ 7,\ 9\}$, $C = \{4,\ 9,\ 11\}$ bo'lsin. Quyidagi to'plamlarda nechtadan element mavjud:

    a) $A \cup (B \cup C)$;   b) $(C \cup B) \cup A$;   d) $A \cap (B \cup C)$;

    e) $A \cup (B \cap C)$;   f) $A \cap (B \cap C)$;   g) $B \cap (A \cup C)$.

17. $A = \{x \mid -5 \le x \le 10\}$, $B = \{x \mid x \in N,\ 3 \le x \le 15\}$ bo'lsin. $A \setminus B$ va $B \setminus A$ to'plam elementlarini toping?

18. Sinfdagibirnechao'quvchimarkayig'dilar. 15 o'quvchiO'zbekistonmarkalarini, 11 kishichet el markalarini, 6 kishi ham O'zbekistonmarkalarini, ham 16 chet el markalariniyig'di. Sinfdanechao'quvchimarkato'plagan?

19. 32 o'quvchining 12 tasivoleybolseksiyasiga, 15 tasibasketbolseksiyasiga, 8 kishiesaikkalaseksiyaga ham qatnashadi. Sinfdaginechao'quvchihechbirseksiyagaqatnashmaydi?

19. 30 o'quvchidan 18 tasimatematikaga, 17 tasiesafizikagaqiziqadi. Ikkalafanga ham qiziqadigano'quvchilarsoninechtabo'lishimumkin?

(***Ko'rsatma.*** Ikkalafanga ham qiziqmaydigano'quvchilarsoni $k \in (0, 1, 2, 3, \dots, 12)$).

20. 100 odamdaniboratsayyohlarguruhida 10 kishinemistilini ham, fransuztilini ham bilmaydi, 75 tasinemistilini, 83 tasiesafransuztilinibiladi. Ikkalatilni ham biladigansayyohlarsonini toping?

21. 26 o'quvchining 14 tasishaxmatga, 16 tasishashkagaqiziqadi. Ham shashkaga, ham shaxmatgaqiziqadigano'quvchilarnechta?