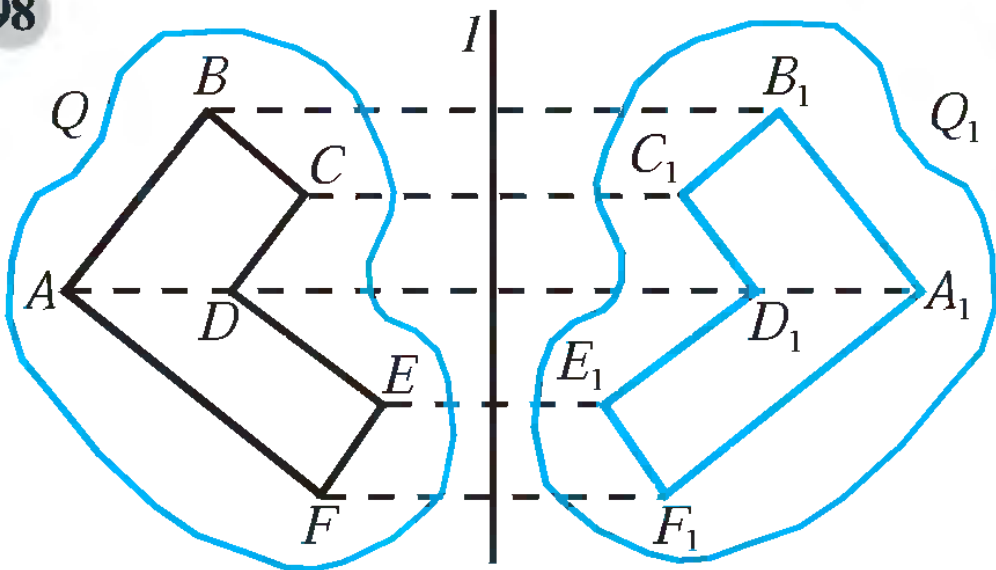


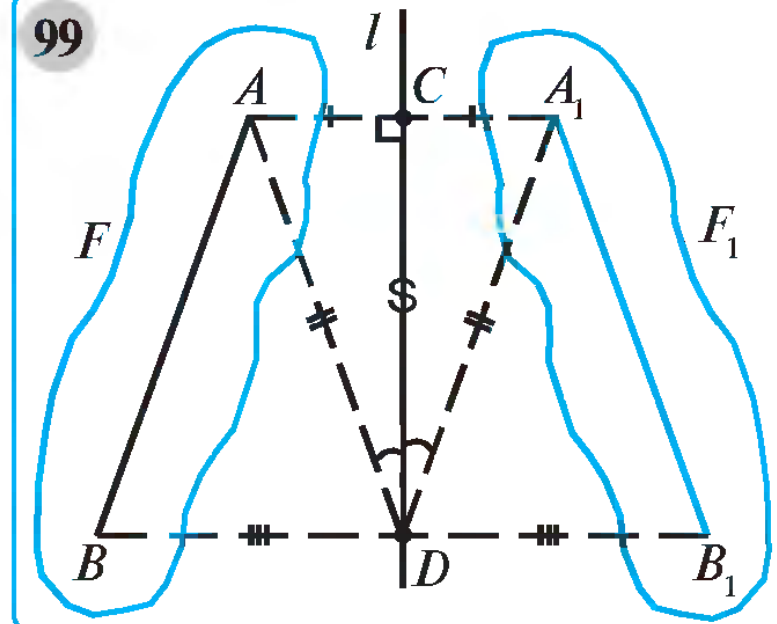
## Mavzu: Nuqtaga va to'g'ri chiziqqa nisbatan simmetriya.

**Ta'rif.** Agar  $Q_1$  shaklning har bir nuqtasi biror  $l$  to'g'ri chiziqqa nisbatan  $Q$  shaklning nuqtalariga simmetrik bo'lsa, bunday shakllar  $l$  to'g'ri chiziqqa nisbatan **simmetrik shakllar** deb ataladi,  $l$  esa **simmetriya o'qi** deyiladi.

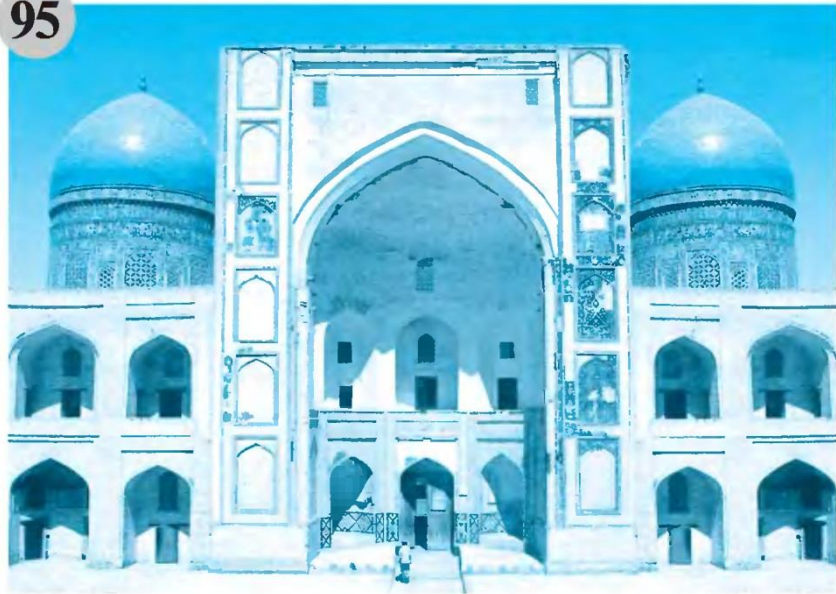
98



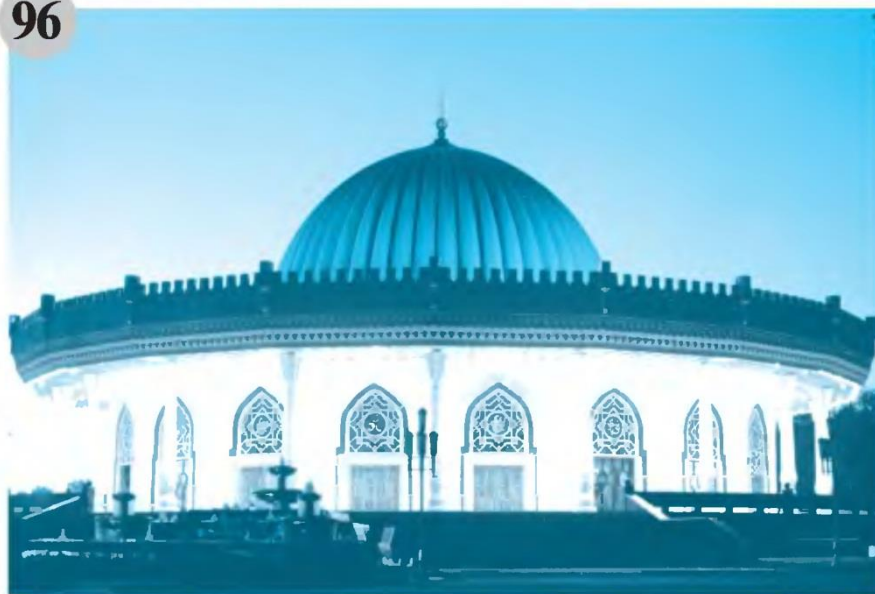
99



95



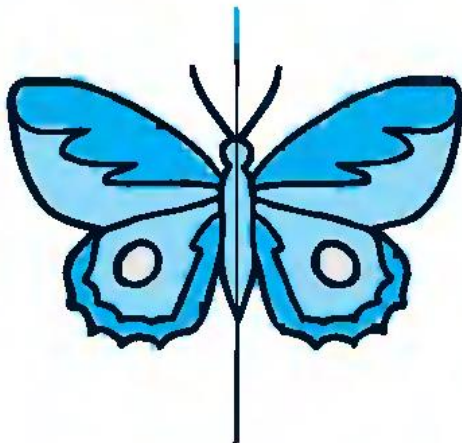
96



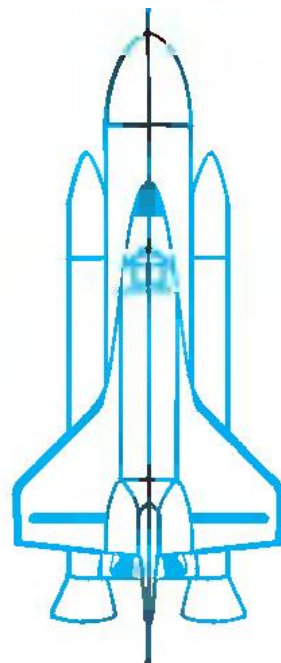
94



*a*



*b*

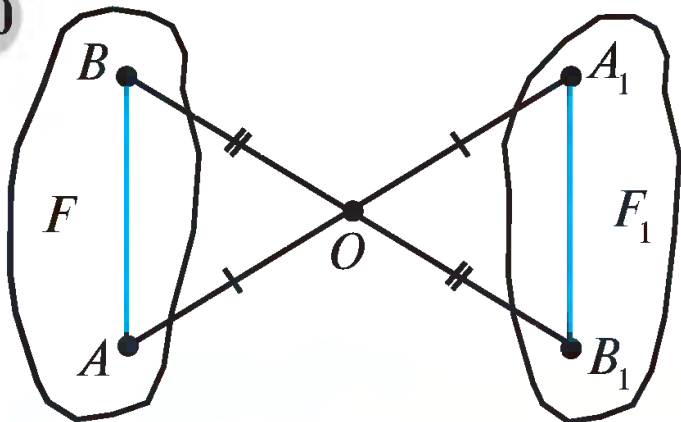


*d*

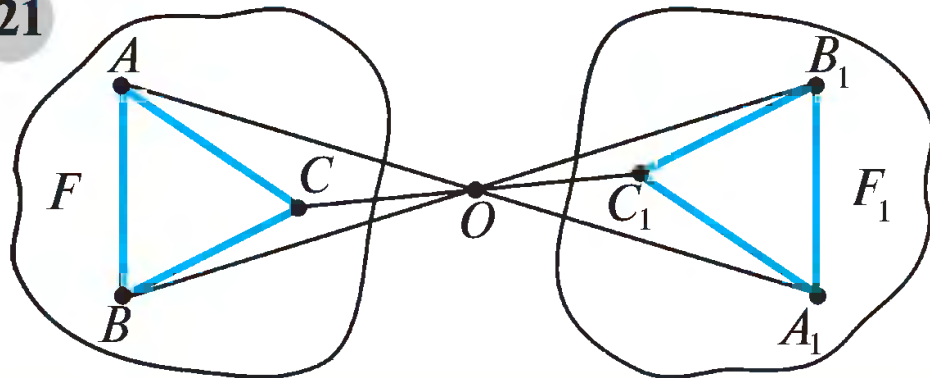
**Ta'rif.** Agar  $F_1$  shaklning har bir nuqtasi  $F$  shaklning mos nuqtalarining  $O$  nuqtaga nisbatan **simmetrik nuqtasi** bo'lsa,  $F$  va  $F_1$  shakllar  $O$  nuqtaga nisbatan **markaziy simmetrik shakllar** deb ataladi.

$O$  nuqta  $F$  va  $F_1$  shakllarning **simmetriya markazi** deb ataladi.

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## 2- teorema.

Markaziy simmetriyada kesmalar kesmalarga, nurlar nurlarga, to'g'ri chiziqlar to'g'ri chiziq'larga o'tadi.

1.  $A(a; b)$  nuqta berilgan. Koordinata o'qlariga nisbatan  $A$  nuqtaga simmetrik nuqta qanday koordinatalarga ega bo'ladi?
2. Tekislikda  $A(4; 3)$ ,  $B(3; -2)$ ,  $C(-2; 2)$  va  $D(-1; -1)$  nuqtalar berilgan. Bu nuqtalarga koordinata o'qlariga nisbatan simmetrik nuqtalarni yasang va ularning koordinatalarini yozing.
3. Tekislikda  $A(-1; -5)$  va  $B(3; 4)$  nuqtalar berilgan. Bu nuqtalarga koordinata o'qlariga nisbatan simmetrik nuqtalarni yasang va ularning koordinatalarini yozing.
4.  $ABCD$  kvadratning uchta uchining koordinatalari berilgan:  $A(0; 2)$ ,  $B(2; 0)$ ,  $D(-2; 0)$ . Shu kvadratni yasang va  $C$  uchining koordinatalarini toping.
5. 1)  $A$  va  $B$  nuqtalar berilgan.  $A$  nuqtaga nisbatan  $B$  nuqtaga simmetrik bo'lgan  $B_1$  nuqtani yasang.
6.  $ABC$  uchburchak berilgan.  $A$  va  $B$  nuqtaga nisbatan  $C$  nuqtaga simmetrik bo'lgan shaklni yasang.

7.  $A(-2; 2)$  va  $B(2; -1)$  nuqtalar berilgan. 1) Koordinatalar boshiga nisbatan berilgan nuqtalarga simmetrik  $A_1$  va  $B_1$  nuqtalarni yasang.  
2)  $A_1$  va  $B_1$  nuqtalarning koordinatalarini yozing.
8.  $A(-3; 5)$  va  $B(2; -4)$  nuqtalar berilgan. Koordinatalar boshiga nisbatan simmetriyada  $AB$  kesmaga simmetrik bo'lgan  $A_1B_1$  kesma uchining koordinatalarini toping.
9.  $A(-1; -4)$  va  $B(3; 2)$  nuqtalar berilgan. 1) Absissalar o'qiga; 2) ordinatalar o'qiga; 3) koordinatalar boshiga; 4) I va III koordinatalar burchaklari bissektrisalariga nisbatan berilgan nuqtalarga simmetrik nuqtalarni yasang va ularning koordinatalarini yozing.
10. Uchburchakning uchlari  $A(-2; 1)$ ,  $B(1; 5)$  va  $C(4; -2)$  nuqtalarda yotadi. Koordinatalar boshiga nisbatan berilgan uchburchakka simmetrik bo'lgan uchburchakning koordinatalarini toping.
11.  $A(3; 5)$ ,  $B(4; 2)$ ,  $C(3; -5)$ ,  $D(-4; -2)$  va  $E(-3; 5)$  nuqtalardan qaysi juftlari: 1) absissalar o'qiga; 2) ordinatalar o'qiga; 3) koordinatalar boshi  $O(0; 0)$  nuqtaga nisbatan simmetrik bo'ladi?
12.  $A(1; 1)$ ,  $B(-2; 0)$ ,  $C(2; 3)$ ,  $D(0; 1)$ ,  $E(-3; 4)$  va  $F(-2; -2)$  nuqtalar berilgan. 1) Absissalar o'qiga; 2) ordinatalar o'qiga; 3) koordinatalar boshi  $O(0; 0)$  nuqtaga nisbatan berilgan nuqtalarga simmetrik nuqtalarni yasang va ularning koordinatalarini yozing.