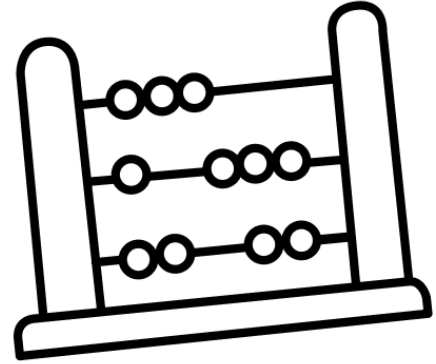


Hubinta fahamka isku ekaanshaha (congruence)



Maths

Cutub: Sifooyinka joomatari (geometrical properties) iyo aragtida Pythagoras

Natiijo

Waxaan awoodaa inaan turjumo (translate), milicsado (reflect), iyo wareejiyo (rotate) qaab.

Erayada muhiimka ah

Haddii qaab uu si sax ah ugu habboonaado korka qaab kale iyadoo la adeegsanayo wareejin (rotation), milicsi (reflection), ama turjumaad (translation), markaas qaababku waa isku ekaansho (congruent).

Wareejinta (rotation) shay waa u jeedinta shay qadar go'an iyo agagaar dhibic go'an (loo yaqaan xarunta wareejinta), iyada oo aan sawirka la jeedin ama cabbirkiisa aan la beddelin.

Shay ayaa la milicsadaa markii loo rogo khad go'an (loo yaqaan khadka milicsiga), iyada oo aan sawirka la jeedin ama cabbirkiisa aan la beddelin.

Turjumaad (translation) waa isbeddel (transformation) kaas oo dhibic kasta oo qaabka u dhaqaaqo masaafo isku mid ah jihada isku mid ah.

Weyneyn (enlargement) waa isbeddel (transformation) keena isbeddel cabbirka.

Qaabka casharka

Hubinta fahamka isku ekaanshaha (congruence)



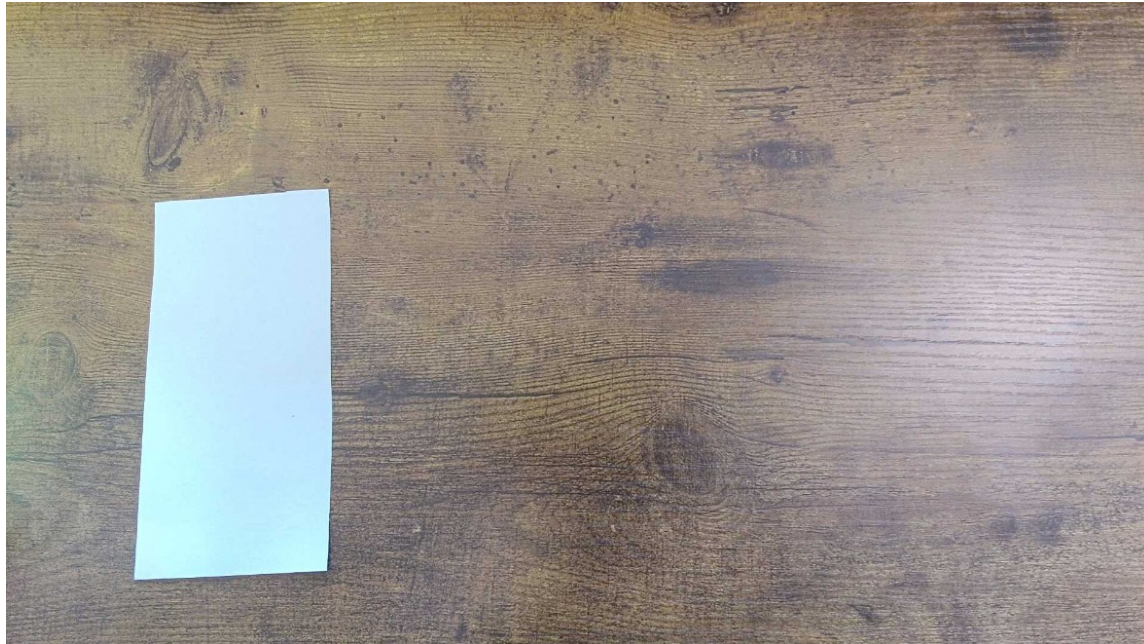
Isbeddellada (transformations) ee isku ekaanshaha (congruence)



Aqoonsiga macluumaadka maqan ee qaababka isku ekaanshaha (congruent)

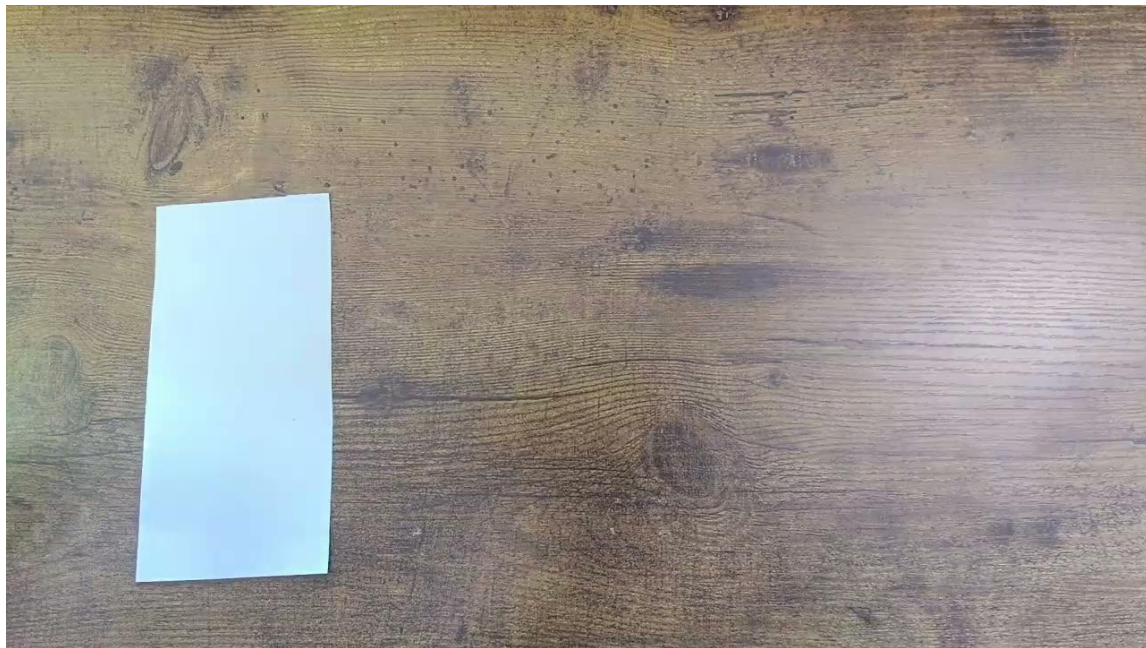
Isbeddellada (transformations) ee isku ekaanshaha (congruence)

Laydi warqad ah ayaa la saaray miis. Cali, Isra, Yacquub, Layla iyo Suad waxay ka wada hadlaan waxa ay ku samayn karaan qaabka.



Isbeddellada (transformations) ee isku ekaanshaha (congruence)

Laydi warqad ah ayaa la saaray miis. Cali, Isra, Yacquub, Layla iyo Suad waxay ka wada hadlaan waxa ay ku samayn karaan qaabka.



Waxaan dhaqaajin karnaa laydiga.

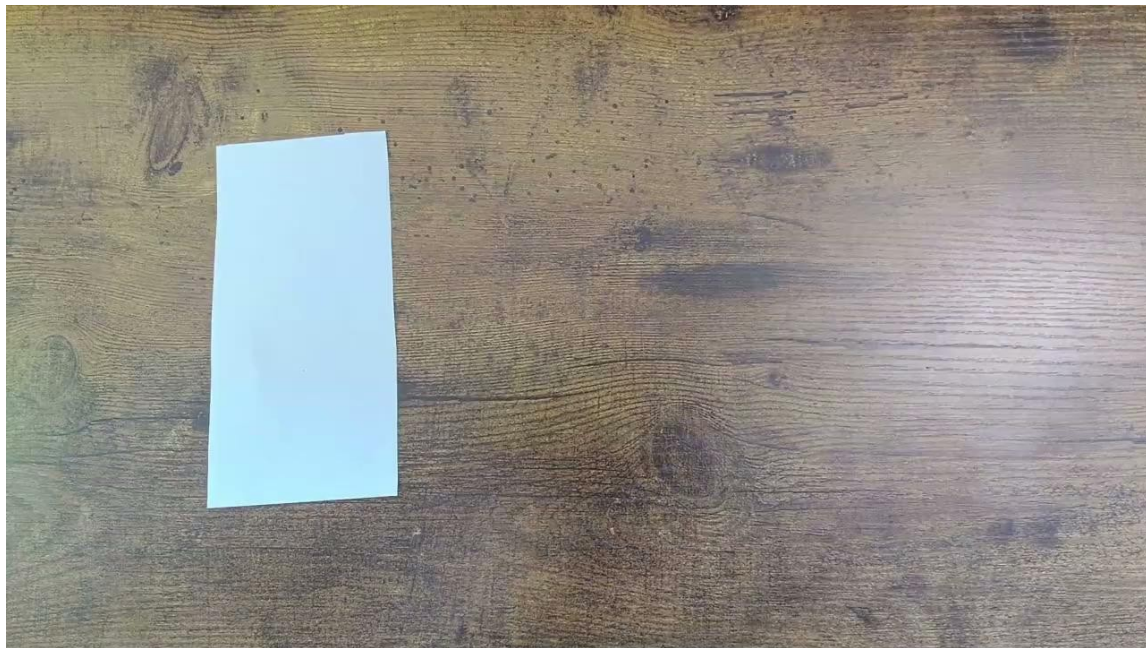
Tani waxay noqon doontaa turjumaad (translation).



Cali

Isbeddellada (transformations) ee isku ekaanshaha (congruence)

Laydi warqad ah ayaa la saaray miis. Cali, Isra, Yacquub, Layla iyo Suad waxay ka wada hadlaan waxa ay ku samayn karaan qaabka.



Waan rogi karnaa leydiga (rectangle).

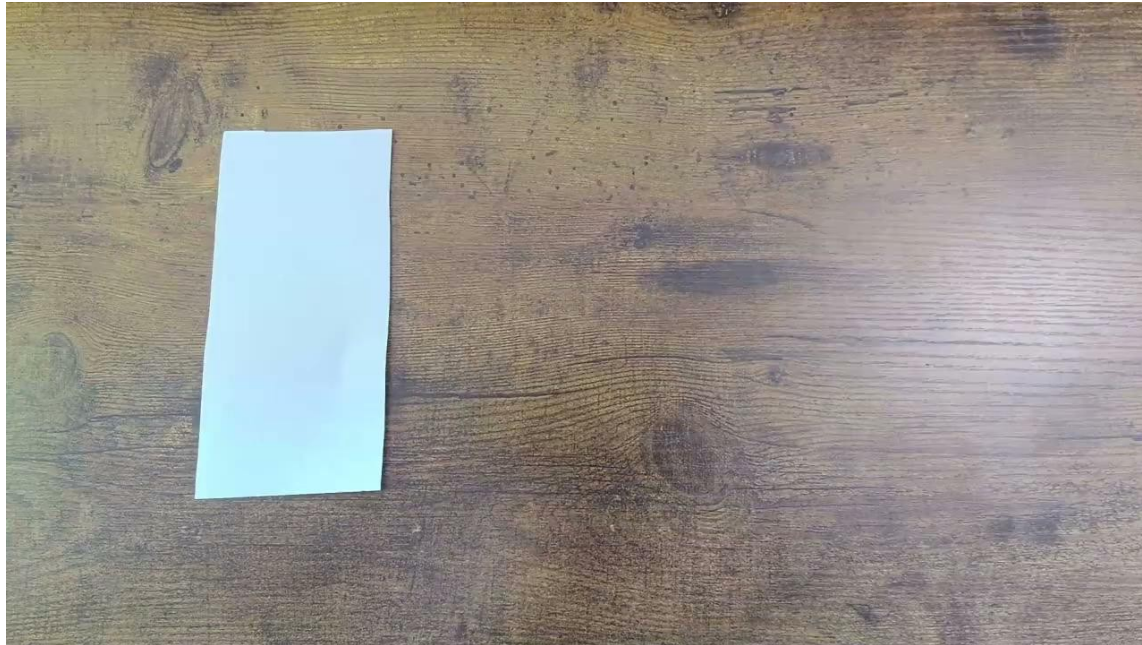
Tani waxay noqonaysaa milicsi (reflection).



Isra

Isbeddello (Transformations) leh isku ekaansho (congruence)

Leydi (rectangle) warqad ah ayaa miis la saaray. Cali, Isra, Yacquub, Layla iyo Suad ayaa ka hadlaya waxay ku samayn karaan qaabka.



Waan leexin karnaa
leydiga (rectangle).

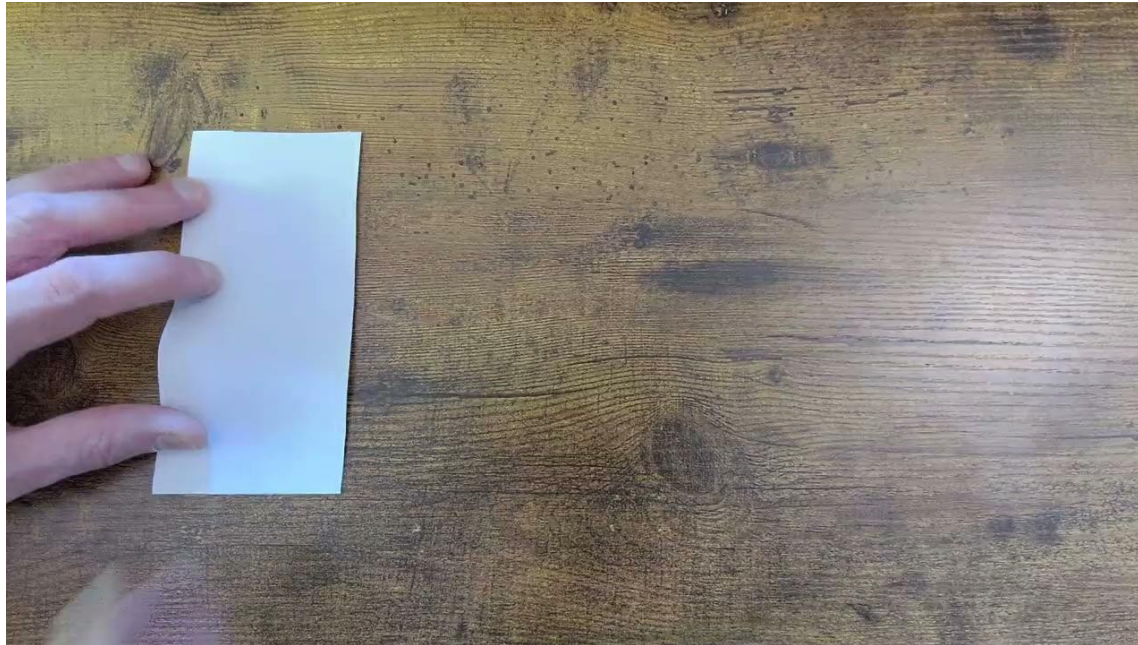
Tani waxay noqonaysaa
wareeg (rotation).



Yacquub

Isbeddello (Transformations) leh isku ekaansho (congruence)

Leydi (rectangle) warqad ah ayaa miis la saaray. Cali, Isra, Yacquub, Layla iyo Suad ayaa ka hadlaya waxay ku samayn karaan qaabka.



Waanu gooyn karnaa leydi (rectangle) yar oo la mid ah.

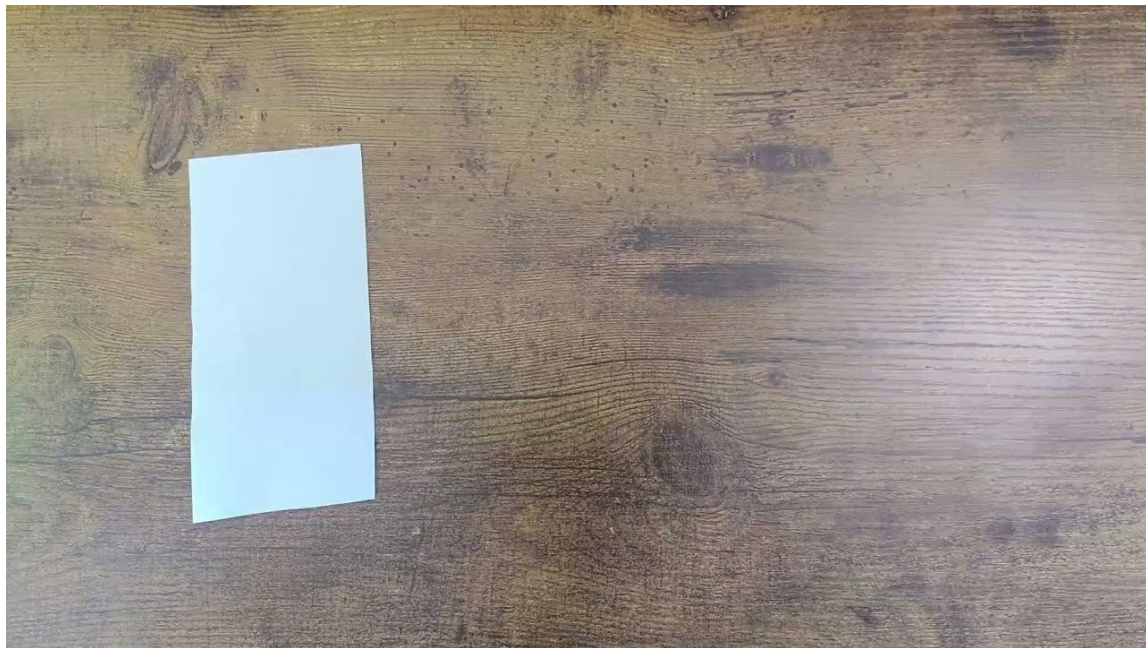
Tani waxay noqonaysaa weyneyn (enlargement).



Layla

Isbeddello (Transformations) leh isku ekaansho (congruence)

Leydi (rectangle) warqad ah ayaa miis la saaray. Cali, Isra, Yacquub, Layla iyo Suad ayaa ka hadlaya waxay ku samayn karaan qaabka.



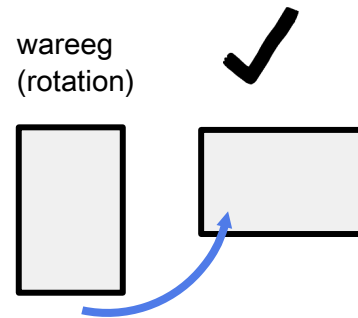
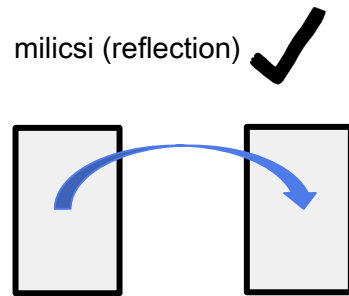
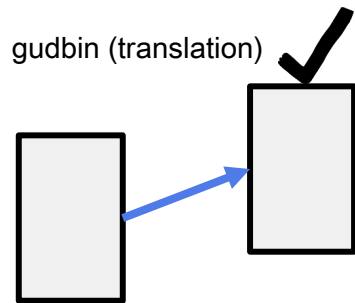
Waanu gooyin karnaa qaab ka duwan.

Tani ma aha isbeddel (transformation) caadi ah.

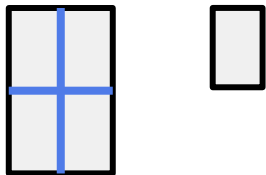


Suad

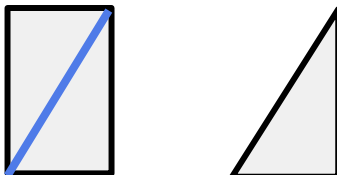
Cali wuxuu ka fikirayaa saamaynta ficil kasta uu ku yeesho qaabka.



Weyneyn (Enlargement)



Beddel qaabka



Falalka qaarkood waxay beddelaan dhererka, qaarna waxay beddelaan xaglaha.

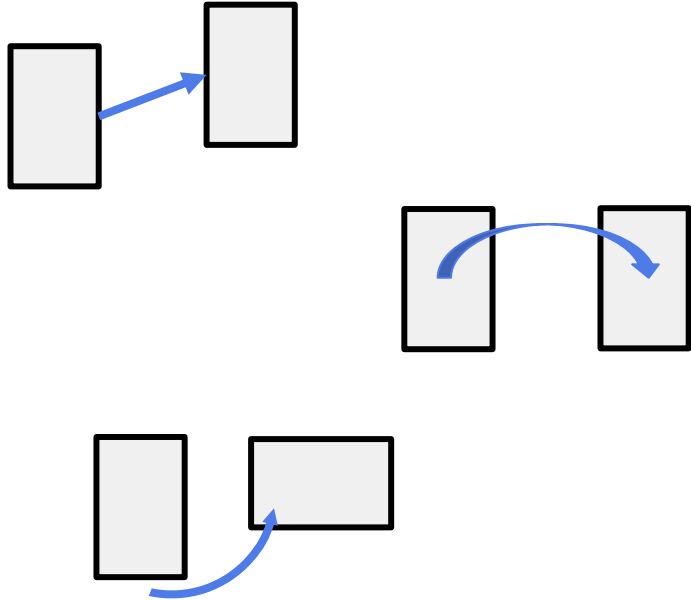
Falalkee ayaa ilaaliya dhererka iyo xaglaha labadaba?



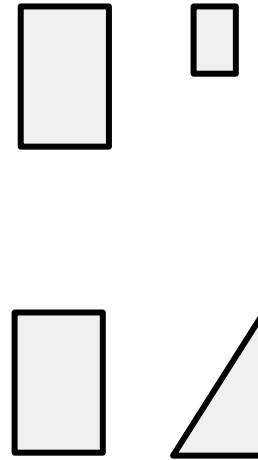
Isbeddellada leh isku midnimo (congruence)

Qaababka leh dherer iyo xaglo isku mid ah waa isku mid (congruent).

lamaanaha qaababka isku midka ah:



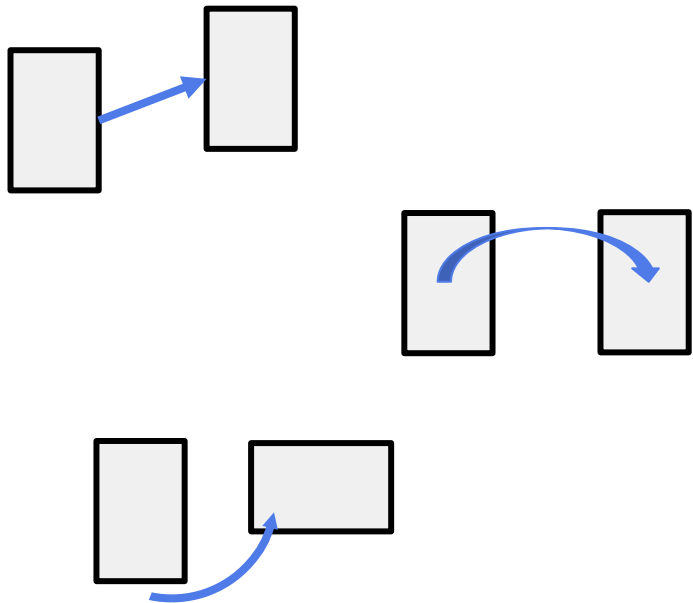
lamaanaha qaababka aan isku midka ahayn:



Isbeddellada leh isku midnimo (congruence)

Qaababka leh dherer iyo xaglo isku mid ah waa isku mid (congruent).

lamaanaha qaababka isku midka ah:



Tani waxay ka dhigan tahay in tarjumaad (translation), milicsi (reflection) iyo wareeg (rotation) ay had iyo jeer soo saaraan sawir isku mid ah shayga.



Isra

Isbeddellada leh isku midnimo (congruence)

Run mise been?

Labada qaab waa isku mid (congruent).



Run



Been



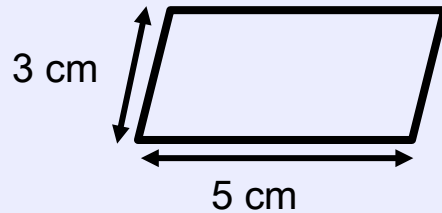
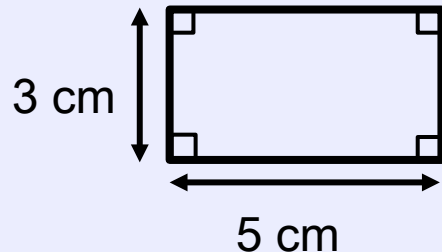
Sabab u sheeg jawaabtaada

a

Qaababku waxay leeyihiin dherer isku mid ah.

b

Qaababku waxay leeyihiin xaglo kala duwan.



Isbeddellada (Transformations) ee isku midnimada (congruence)



Hubi

Run mise been?

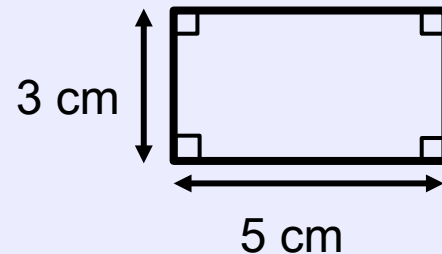
Labada qaab waa isku mid (congruent).



Run



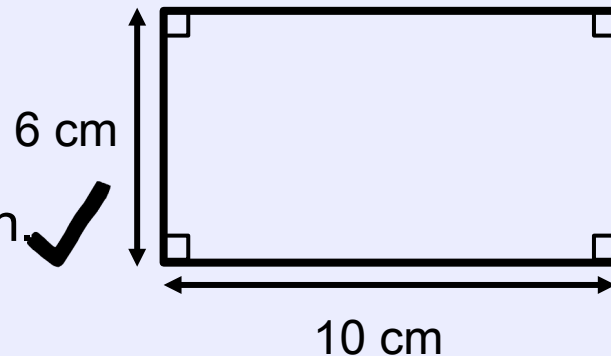
Been



Sabab u sheeg jawaabtaada

a

Qaababku waxay leeyihiin dherer kala duwan.



b

Qaababku waxay leeyihiin xaglo isku mid ah.

Isbeddellada (Transformations) ee isku midnimada (congruence)

Run mise been?

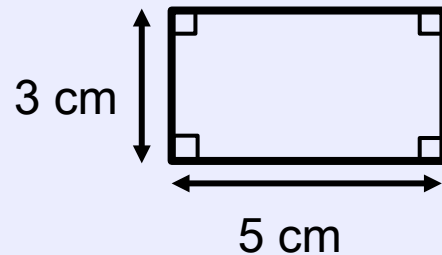
Labada qaab waa isku mid (congruent).



Run



Been



Sabab u sheeg jawaabtaada

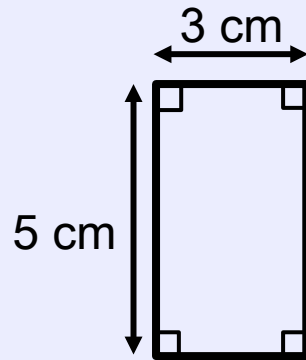
a

Qaababku waxay leeyihiin dherer iyo xaglo isku mid ah.



b

Qaababku waxay ku jiraan jihooyin kala duwan.



Isbeddellada (Transformations) ee isku midnimada (congruence)

Isbeddellada (Transformations) kee ayaa had iyo jeer keena sawir (image) la mid ah (congruent) shayga asalka ah?

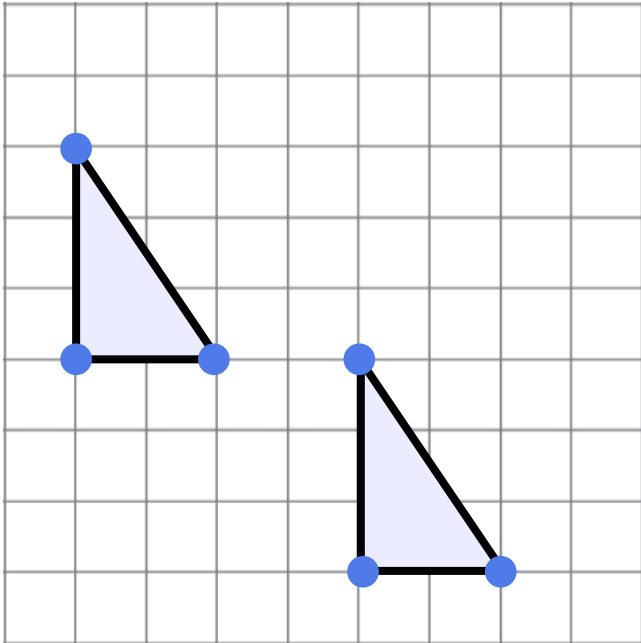
a Weyneyn (Enlargement)

b Milicsi (Reflection) ✓

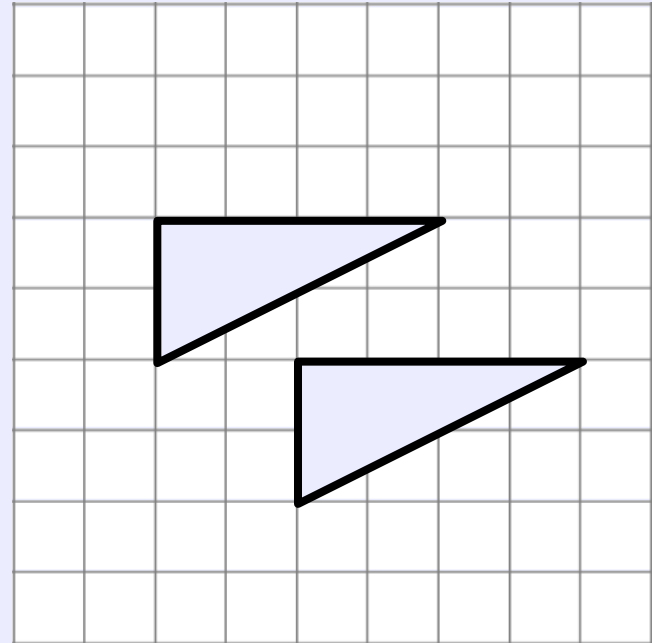
c Wareejin (Rotation) ✓

d Gudbin (Translation) ✓

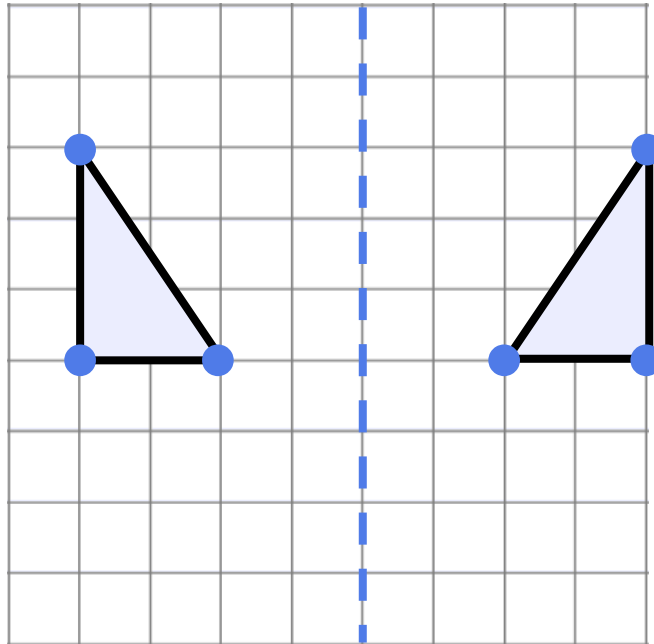
Soo saar qaab isku mid ah (congruent) adoo gudbinaya (translating) shayga . $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$



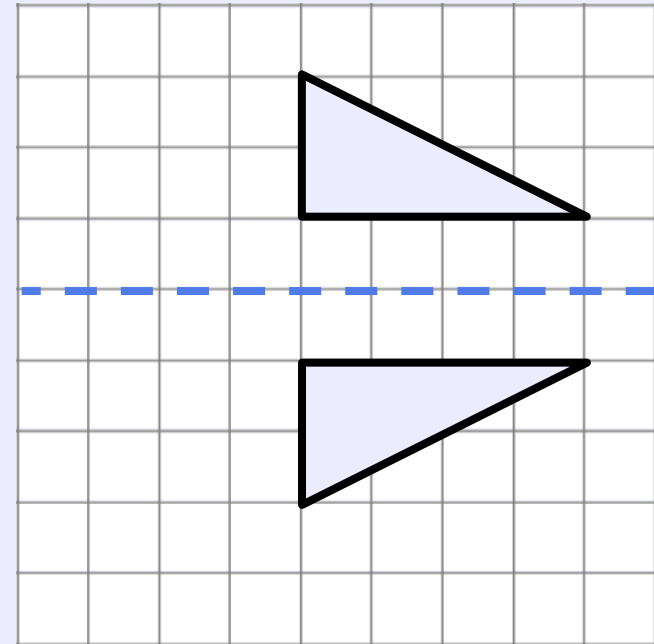
Soo saar qaab isku mid ah (congruent) adigoo u guurinaya shayga (object) . $\begin{pmatrix} -2 \\ 2 \end{pmatrix}$



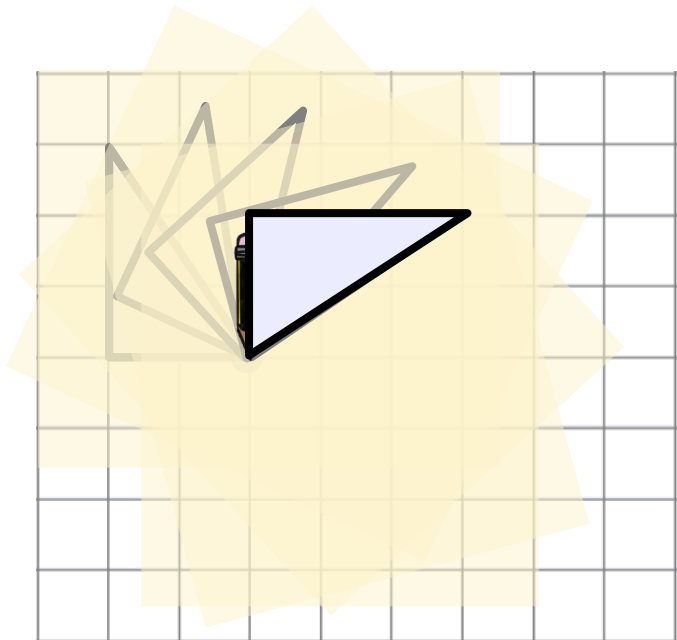
Soo saar qaab isku mid ah (congruent) adigoo ka milicsanaya shayga (object) khadka.



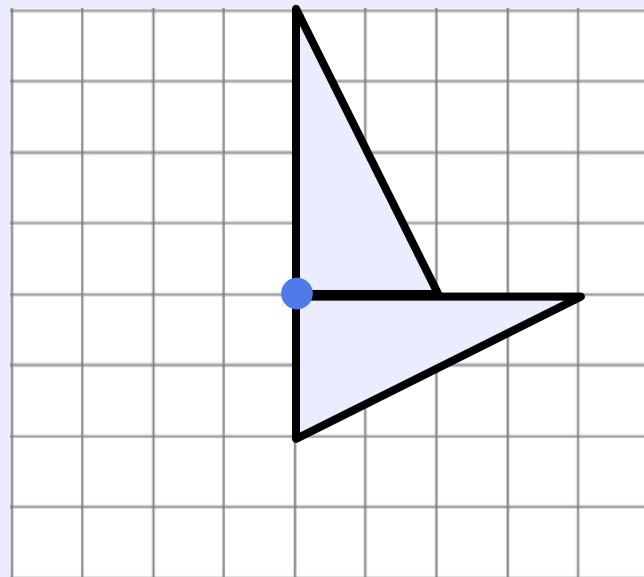
Soo saar qaab isku mid ah (congruent) adigoo ka milicsanaya shayga (object) khadka.



Soo saar qaab isku mid ah (congruent) adigoo wareejinaya shayga (object) 90° saacad (clockwise) agagaarka barta.



Soo saar qaab isku mid ah (congruent) adigoo wareejinaya shayga (object) 90° ka soo horjeeda saacadda (anticlockwise) agagaarka barta.



1) a) Milicsi A korka PT.

b) Wareeji B 180° agagaarka U.

c) Guuri C .

$$\begin{pmatrix} 6 \\ -3 \end{pmatrix}$$

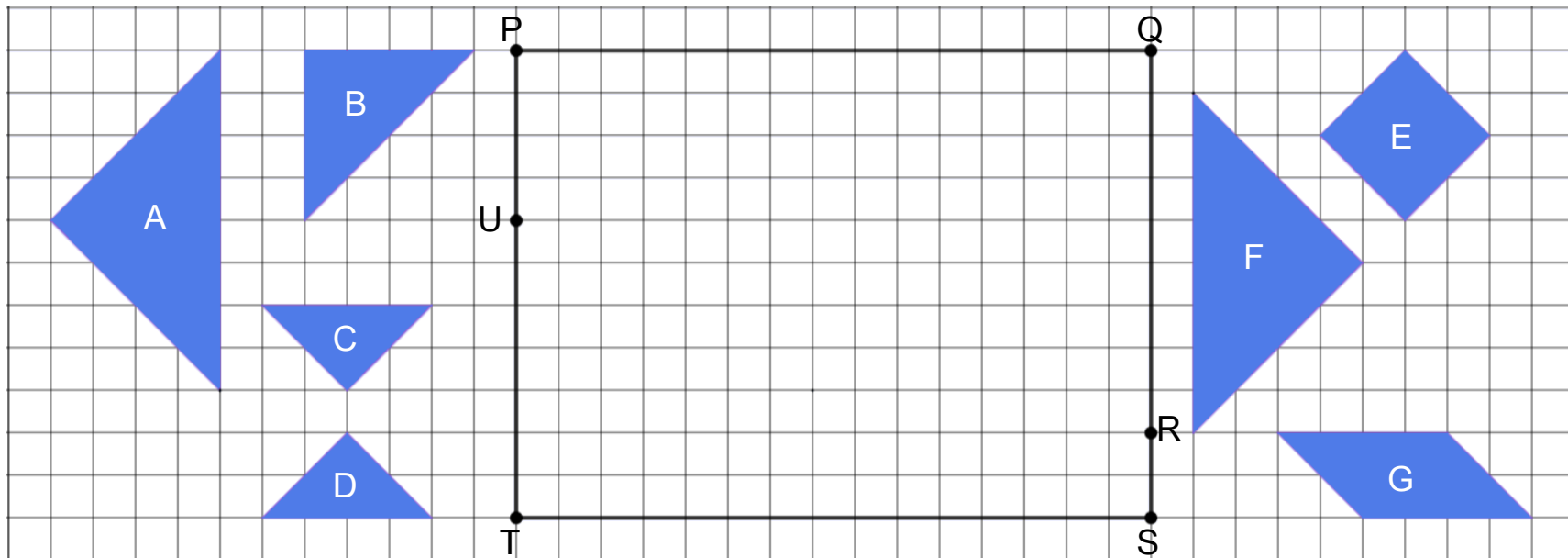
d) Milicsi D korka PT.

e) Guuri E .

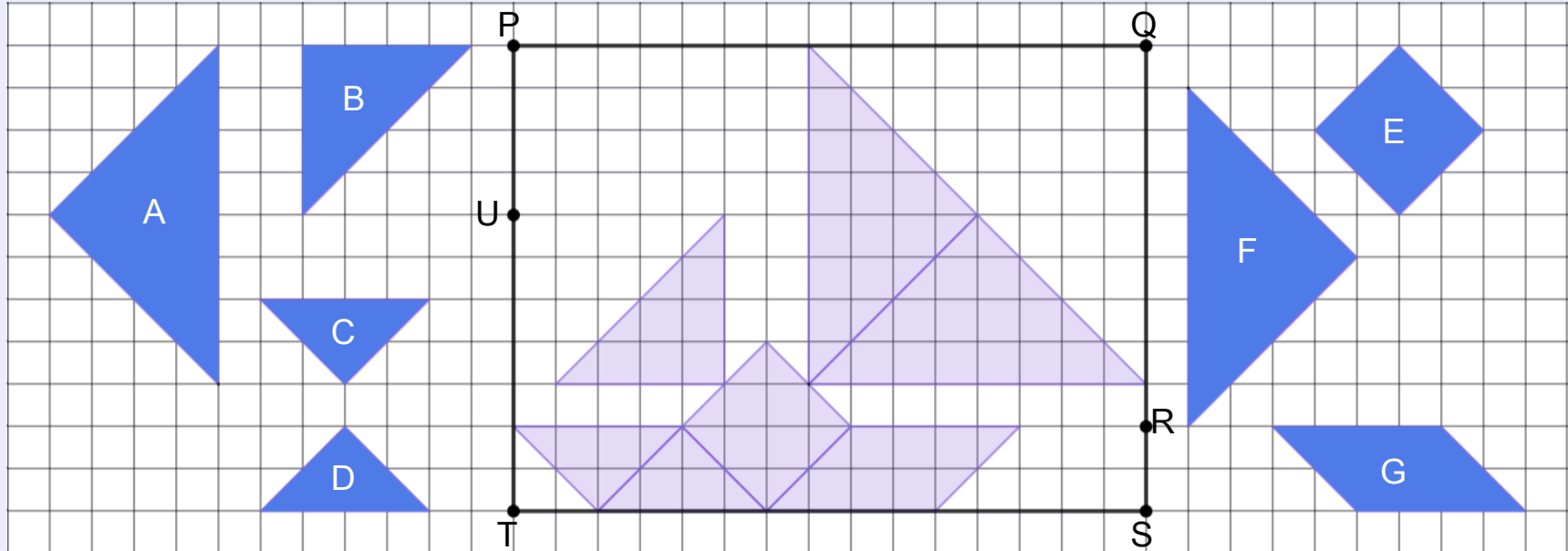
$$\begin{pmatrix} -15 \\ -7 \end{pmatrix}$$

f) Wareeji F 90° ka soo horjeeda saacadda (anticlockwise) agagaarka R.

g) Milicsi G korka QS.



- 1) a) Milicsi A korka PT. b) Wareeji B 180° agagaarka U. c) Guuri C .
d) Milicsi D korka PT. e) Guuri E . $\begin{pmatrix} -15 \\ -7 \end{pmatrix}$
f) Wareeji F 90° saacad-darro ah oo ku wareegsan R. g) Ka milicsan G korka QS.



Hubinta fahamka isku-ekaanshaha (congruence)



Isbeddellada (Transformations) oo leh isku-ekaansho (congruence)



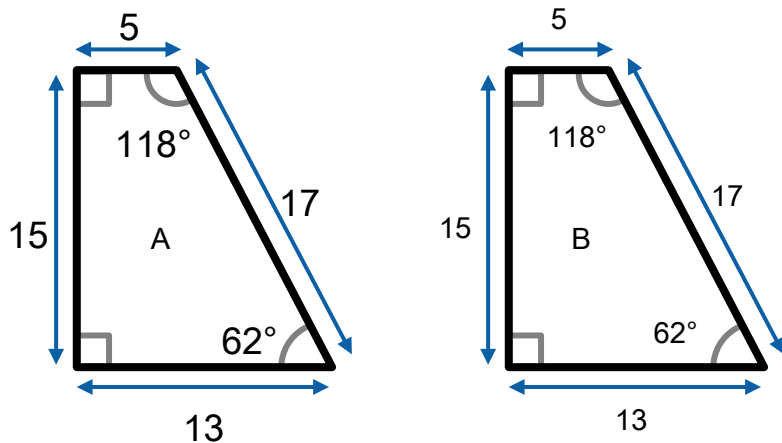
Aqoonsashada macluumaadka maqan ee qaababka isku-ekaanshaha (congruent)

Milicsiga (Reflection), wareejinta (rotation) iyo turjumaadda (translation) had iyo jeer waxay soo saaraan sawir la mid ah (congruent) shayga.

Marka laba qaab isku-ekaansho (congruent) yihiin, dhererkooda iyo xaglohooduba waa isku mid.

Boo'aha (positions) iyo jihada (orientation) dhererka iyo xaglaha way kala duwanaan karaan, laakiin weli waxay ilaalinayaan isku nidaamka.

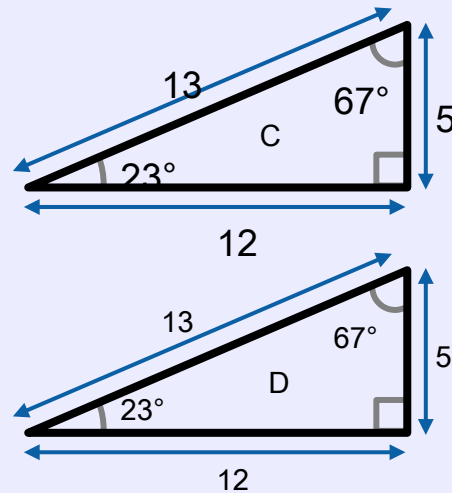
Qaababka A iyo B waa isku-ekaansho (congruent).



Waa maxay isbeddelka (transformation) uu A ugu qoro B?
turjumaad (translation)

Ku calaamadee qaabka B dhererkiisa iyo xaglaha maqan.

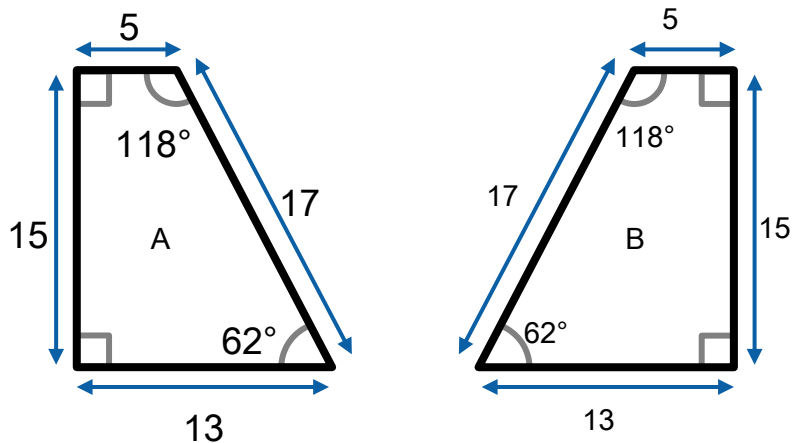
Qaababka C iyo D waa isku-ekaansho (congruent).



Waa maxay isbeddelka (transformation) uu C ugu qoro D?
turjumaad (translation)

Ku calaamadee qaabka D dhererkiisa iyo xaglaha maqan.

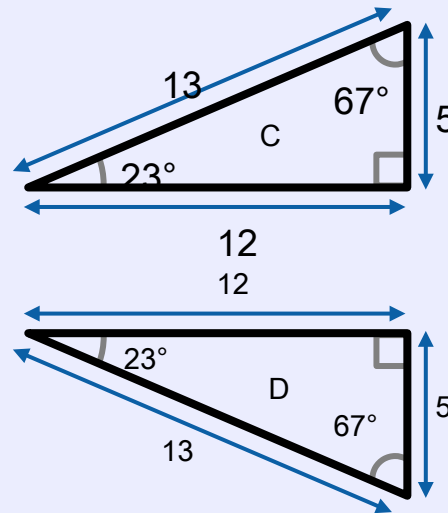
Qaababka A iyo B waa isku-ekaansho (congruent).



Waa beddelkeedee (transformation) oo A ku saabsan B?
milicsi (reflection)

Ku calaamadee qaabka B dhererkiisa iyo xaglaha maqan.

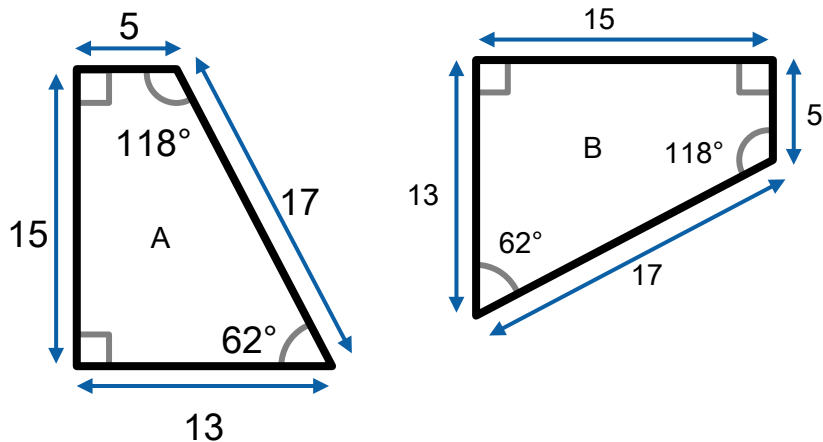
Qaababka C iyo D waa isku-ekaansho (congruent).



Waa beddelkeedee (transformation) oo C ku saabsan D?
milicsi (reflection)

Ku calaamadee qaabka D dhererkiisa iyo xaglaha ka maqan.

Qaababka A iyo B waa isku mid (congruent).

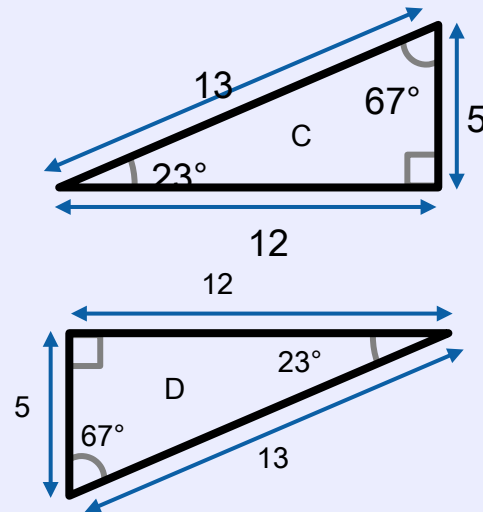


Waa beddelkeedee (transformation) oo A ku saabsan B?

wareeg (rotation)

Ku calaamadee qaabka B dhererkiisa iyo xaglaha ka maqan.

Qaababka C iyo D waa isku mid (congruent).



Waa beddelkeedee (transformation) oo C ku saabsan D?

wareeg (rotation)

Ku calaamadee qaabka D dhererkiisa iyo xaglaha ka maqan.

1) Shanta saddexagal waa isku mid (congruent).

a) Waa beddelkeedee (transformation) oo A ku saabsan B?

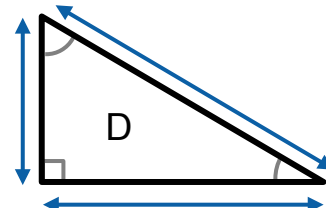
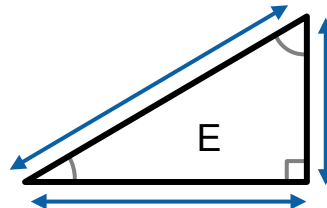
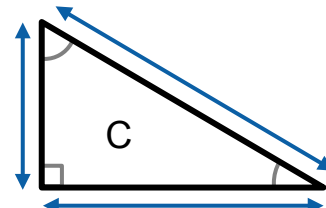
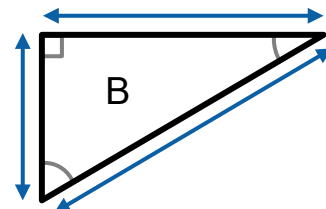
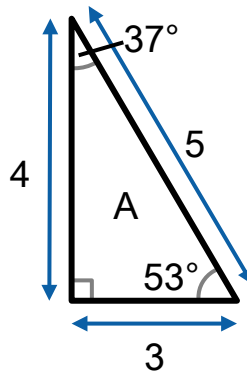
b) Waa beddelkeedee (transformation) oo B ku saabsan C?

c) Waa beddelkeedee (transformation) oo C ku saabsan D?

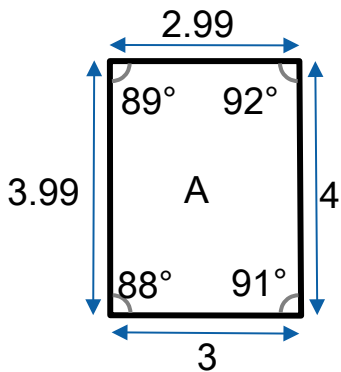
d) Waa beddelkeedee (transformation) oo D ku saabsan E?

e) Waa beddelkeedee (transformation) oo E ku saabsan A?

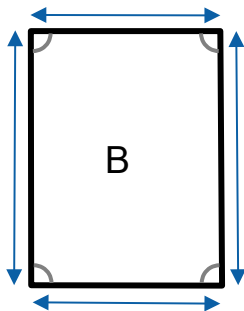
f) Ku calaamadee dhererka iyo xaglaha ka maqan ee saddexagallada B ilaa E.



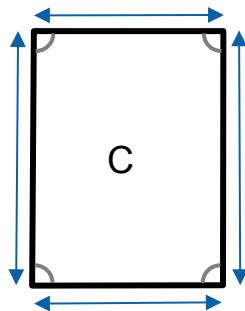
2) Afarta geesoodle (quadrilaterals) waa isku qaab (congruent). Isbeddellada (transformations) qaab kasta u beddelaya qaabka xiga ayaa hoos ku qoran.



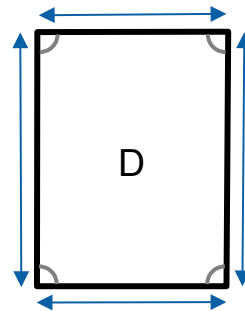
$A \mapsto B$: guur (translation)



$B \mapsto C$: milicsi (reflection)



$C \mapsto D$: wareeg (rotation) 180°



a) Ku calaamadee dhererka (lengths) iyo xaglaha (angles) maqan ee qaababka B ilaa D.

b) Waa maxay isbeddel (transformation) lagu dabaqi karo qaabka D si loo abuuro sawir (image) la jihaysan (orientation) la mid ah qaabka A?

1) Shanta saddex-xagal (triangles) waa isku qaab (congruent).

a) Waa maxay isbeddel (transformation) A u beddelaya B?

wareeg
(rotation)

b) Waa maxay isbeddel (transformation) B u beddelaya C?

milicsi (reflection)

c) Waa maxay isbeddel (transformation) C u beddelaya D?

guur (translation)

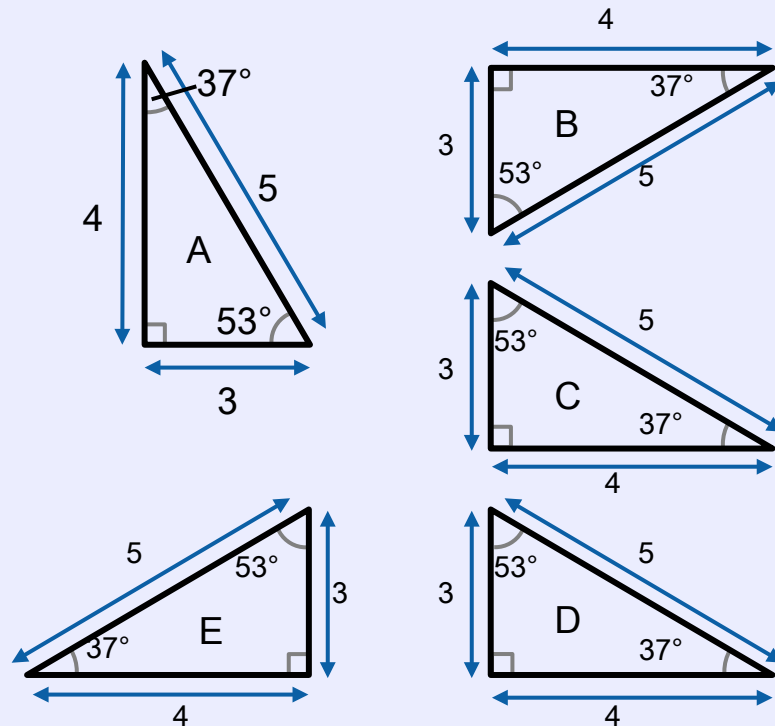
d) Waa maxay isbeddel (transformation) D u beddelaya E?

milicsi (reflection)

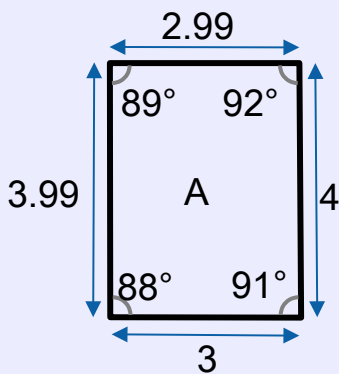
e) Waa maxay isbeddel (transformation) E u beddelaya A?

wareeg
(rotation)

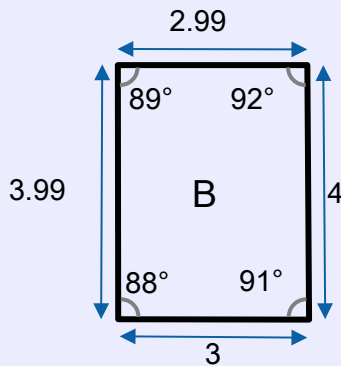
f) Ku calaamadee dhererka (lengths) iyo xaglaha (angles) maqan ee saddex-xagallada B ilaa E.



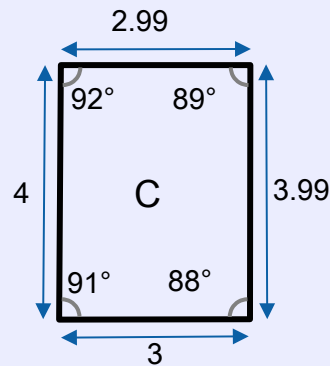
2) Afarta geesoodle (quadrilaterals) waa isku qaab (congruent). Isbeddellada (transformations) qaab kasta u beddelaya qaabka xiga ayaa hoos ku qoran.



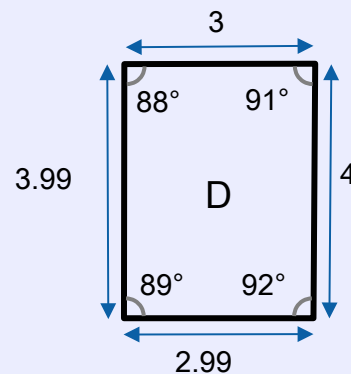
$A \mapsto B$: guur (translation)



$B \mapsto C$: milicsi (reflection)



$C \mapsto D$: wareeg (rotation) 180°



a) Ku calaamadi dhererka iyo xaglaha ka maqan ee qaababka B ilaa D.

b) Waa maxay isbeddel (transformation) lagu dabaqi karo qaabka D si loo abuuro sawir isku jiho ah sida qaabka A?

milicsi (reflection) (iyada oo loo marayo xariiq toosan)

Soo koobid Hubinta fahamka isku midnimada (congruence)

- Guur (translation), milicsi (reflection) iyo wareeg (rotation) waxay soo saaraan sawir isku mid ah (congruent) shayga.
- Marka laba qaab ay isku mid yihiin (congruent), waxay leeyihiin dherer iyo xaglo isku mid ah.
- Guur (translation) wuxuu ku lug leeyahay dhaqaaqinta qaab si loo abuuro sawir isku mid ah (congruent).
- Wareeg (rotation) wuxuu ku lug leeyahay u leexinta qaab agagaarka barta la qeexay si loo abuuro sawir isku mid ah (congruent).
- Milicsi (reflection) wuxuu ku lug leeyahay rogida qaab si loo abuuro sawir isku mid ah (congruent).