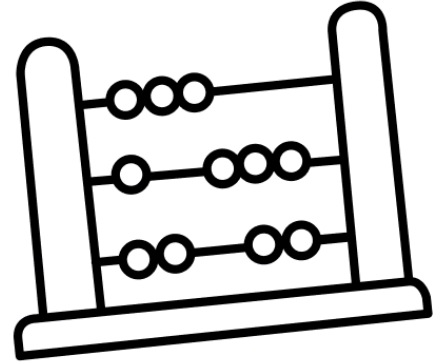


Sii wadista muujinta aragtida Pythagoras (Pythagoras' theorem)



Maths

Unit Sifooyinka joomatari: isku ekaansho (similarity) iyo aragtida Pythagoras (Pythagoras' theorem)

Natiijo

Waxaan qiimeyn (value) karaa inuu jiro xiriir ka dhexeeya dhererka dhinacyada saddexagal qumman (right-angled triangle).

Erayada muhiimka ah

Aragtida Pythagoras (Pythagoras' theorem) waxay tusinaysaa in wadarta labajibbaaranaha (squares) labada dhinac ee gaagaaban ee saddexagal qumman (right-angled triangle) ay la mid tahay labajibbaaranaha (square) dhinaca ugu dheer (hypotenuse).

Qaabka casharka

Sii wadista muujinta aragtida Pythagoras (Pythagoras' theorem)



Abuurista saddexagallo qumman (right-angled triangles) oo ka soo jeeda labajibbaarro (squares)



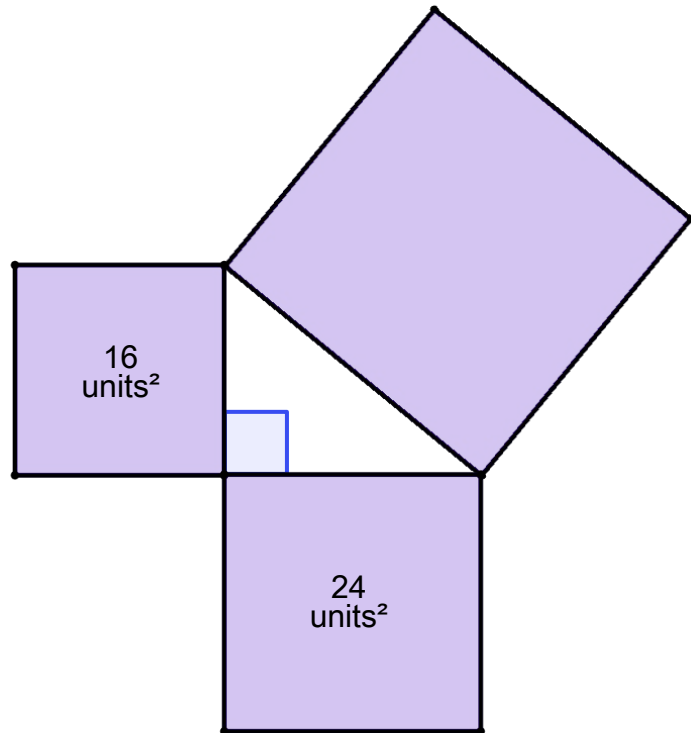
Soo bandhigida aragtida Pythagoras (Pythagoras' theorem)



Layla

Haddaba, haddii aan ogahay bedka (areas) laba labajibbaaranood (squares), markiiba waxaan ogahay cabbirka labajibbaaranaha (square) saddexaad ee aan u baahanahay si aan u abuuro saddexagal qumman (right-angled triangle)?

Bedka (areas) labada labajibbaaranood ee yar waa inay isku daraan si ay u sameeyaan bedka (area) labajibbaaranaha (square) weyn.





Markaas kaliya qiyaas dhererka (length) mid ka mid ah dhinacyadeeda, ka dibna labajibbaaro (square) dhererkaas si aad u hesho bedkeeda (area) habkaas.

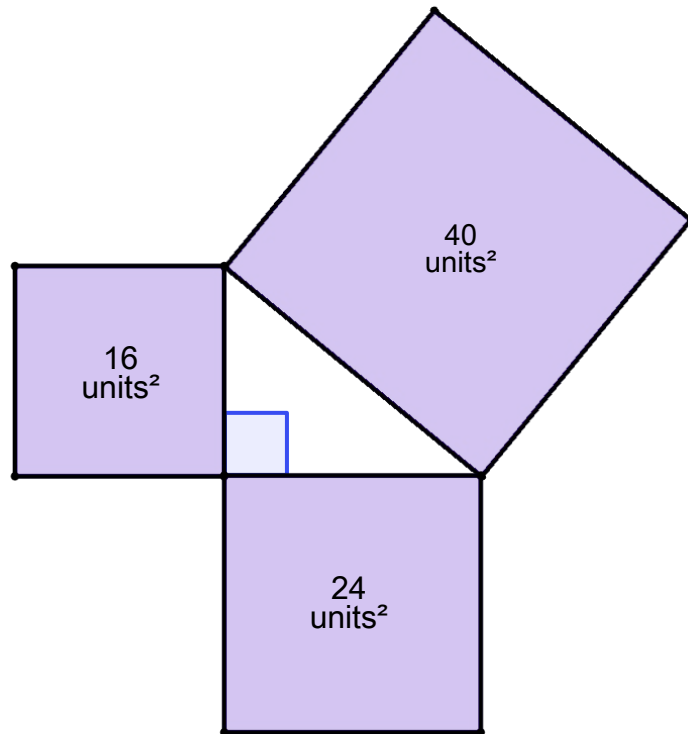


Layla

Laakiin haddii aadan garanayn bedka (area) labajibbaarannada (squares)?



Axmed





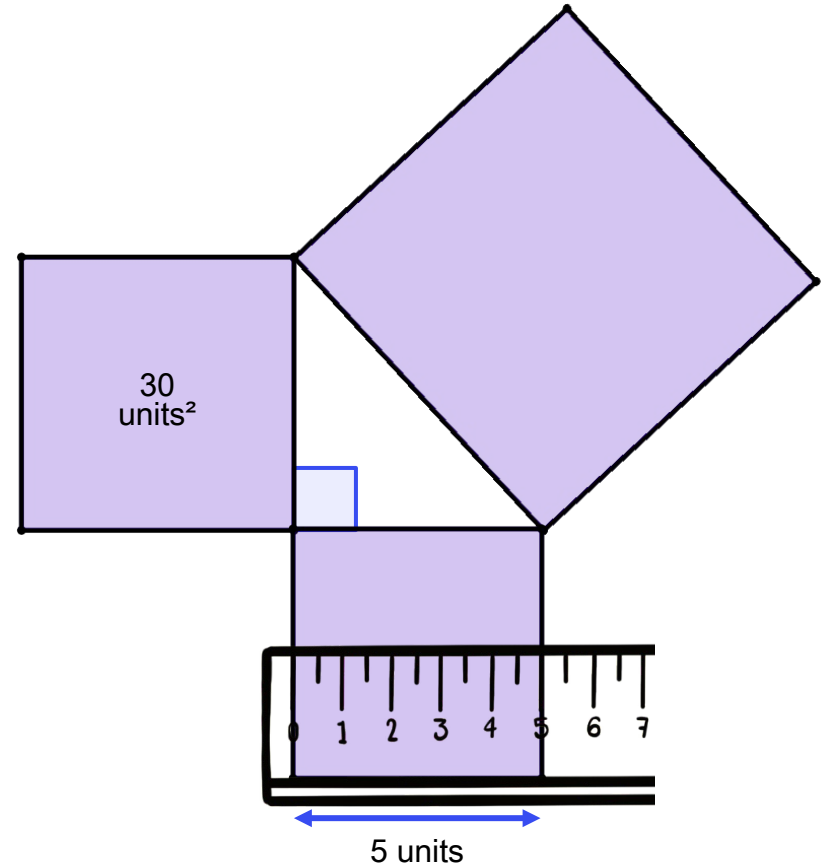
Layla

Markaas kaliya qiyaas dhererka (length) mid ka mid ah dhinacyadeeda, ka dibna labajibbaaro (square) dhererkaas si aad u hesho bedkeeda (area) habkaas.



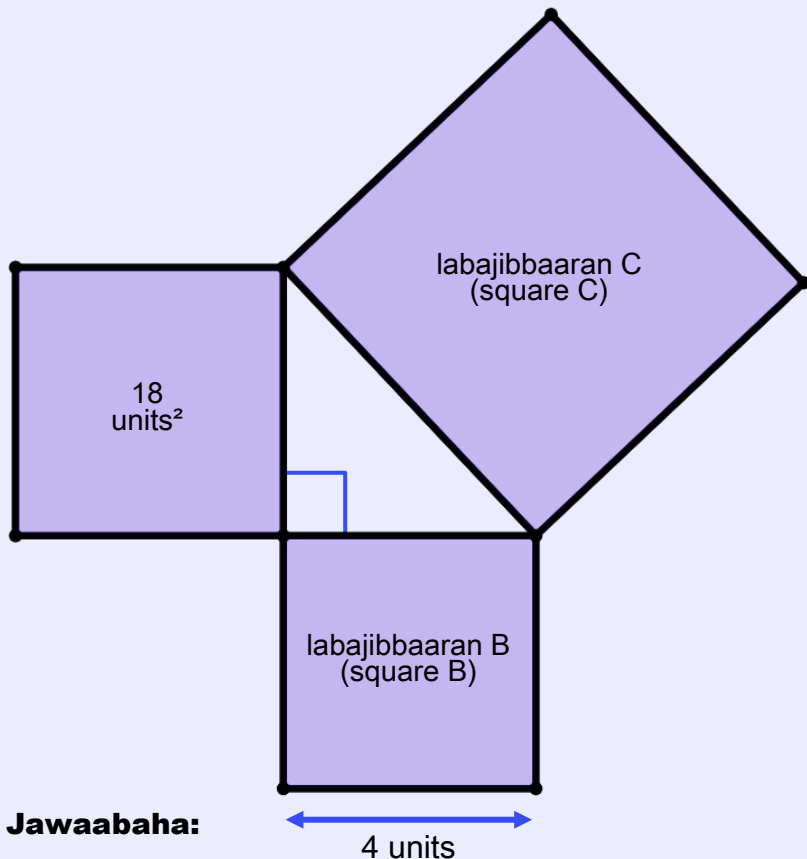
Axmed

Laakiin haddii aadan garanayn bedka (area) labajibbaarannada (squares)?



Waa maxay bedka (area) labajibbaaran B (square B), marka la eego units^2 ?

Sidaas awgeed, waa maxay bedka (area) labajibbaaran C (square C), marka la eego units^2 ?



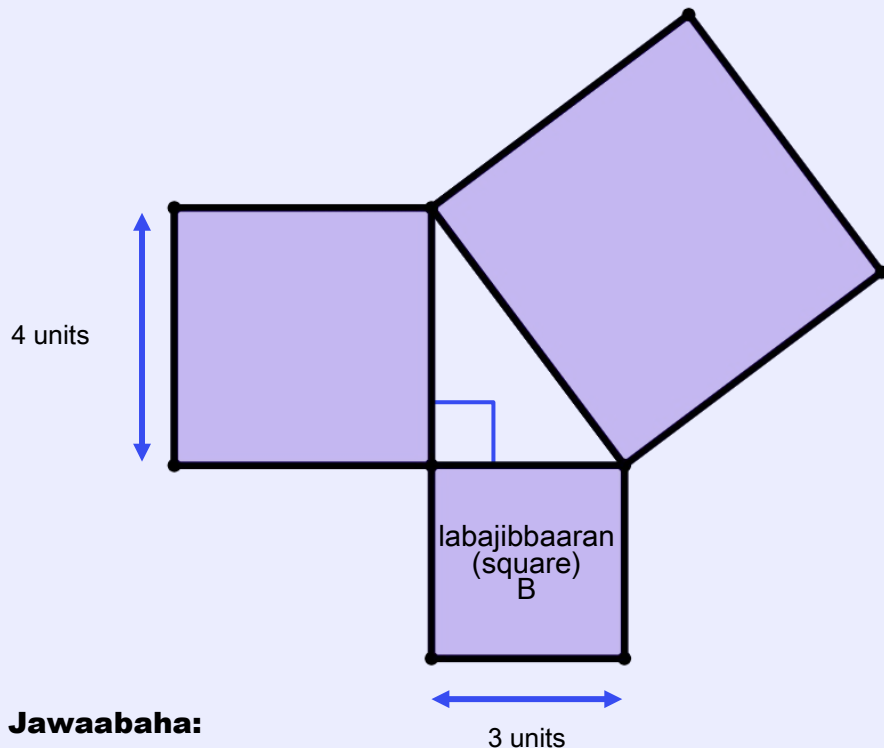
Jawaabaha:

Dhammeysti jumladaha soo socda:

Bedka (area) labajibbaaran A waa _____ 16 units^2

Bedka (area) labajibbaaran B waa _____ 9 units^2

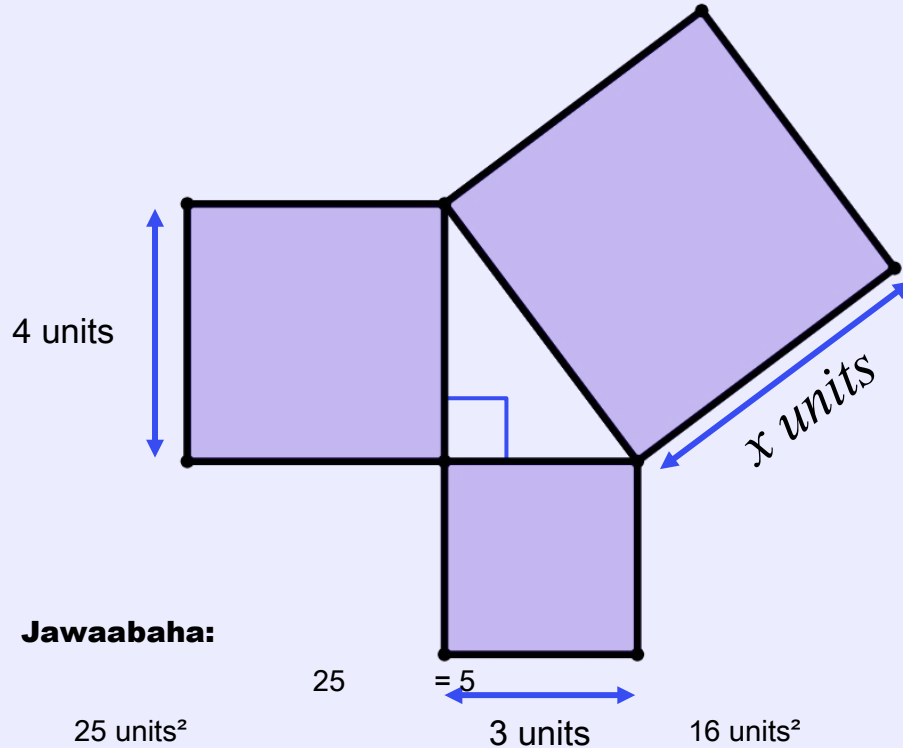
Bedka (area) labajibbaaran C waa _____ $16 + 9$



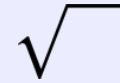
Jawaabaha:

labajibbaaran C
(square C)

labajibbaaran A
(square A)



Waa maxay qiimaha (value) x , dhererka dhinaca labajibbaaran C?

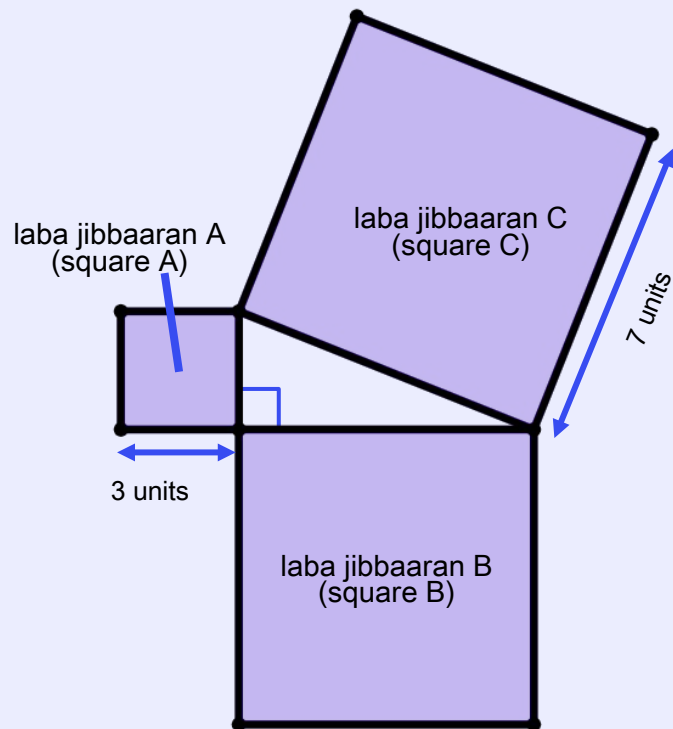


Dhererka dhinaca laba jibbaaran C waa 5 units.

Sameynta saddexagalka xagal-qumman (right-angled triangles) oo laga soo saaray laba jibbaaranayaal (squares)



Hubi



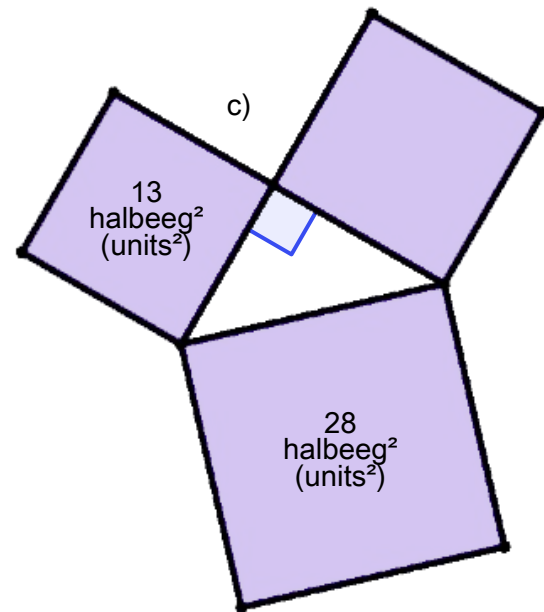
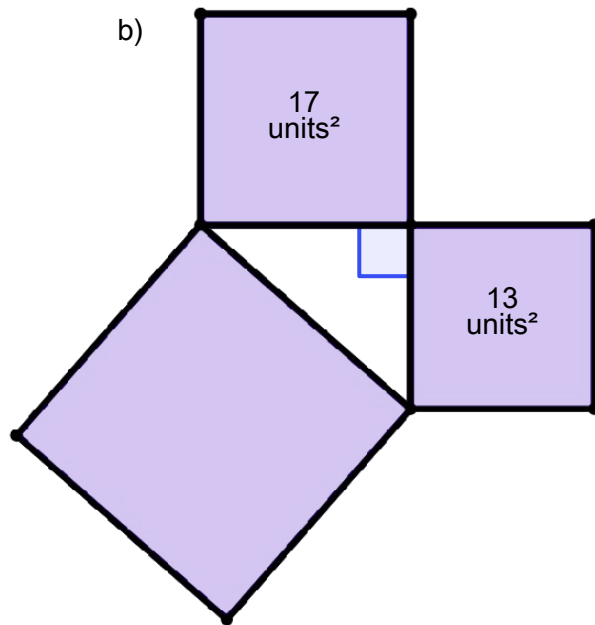
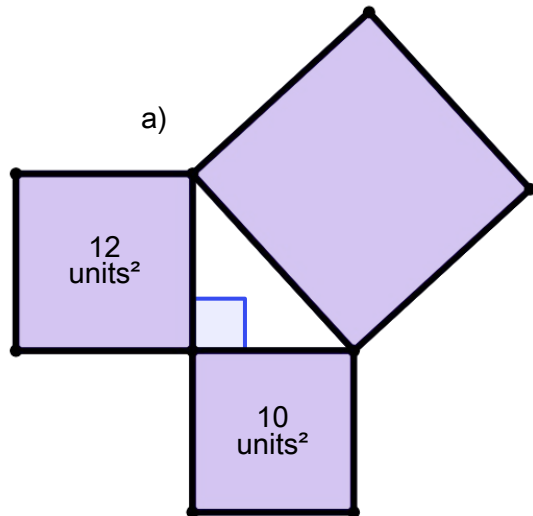
Dhammeysti weedhaha soo socda:

Bedka (area) laba jibbaaran A waa _____

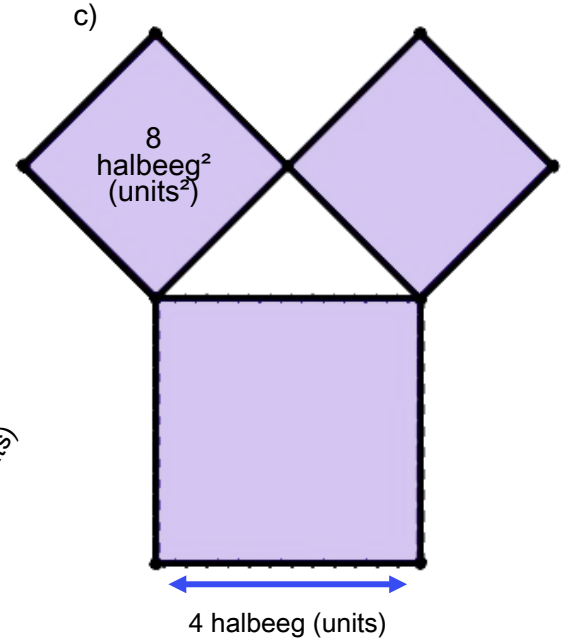
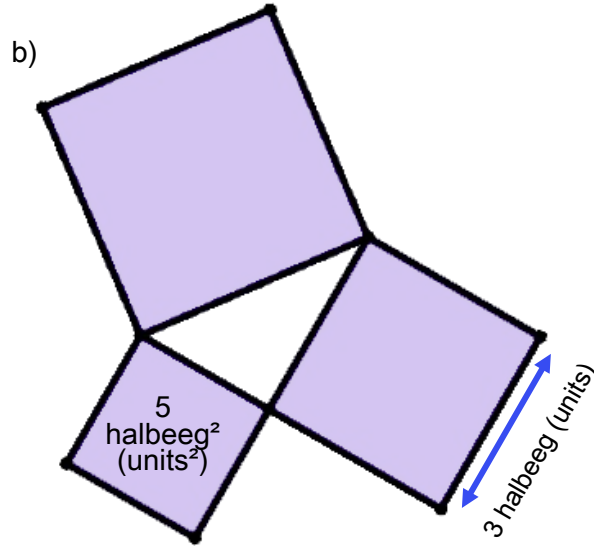
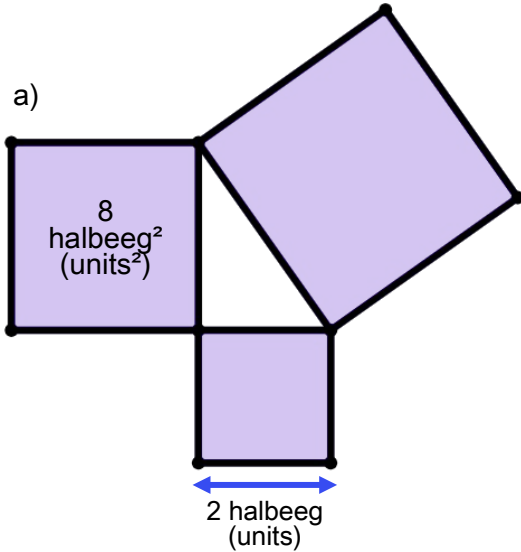
Bedka (area) laba jibbaaran B waa _____

Bedka (area) laba jibbaaran C waa _____

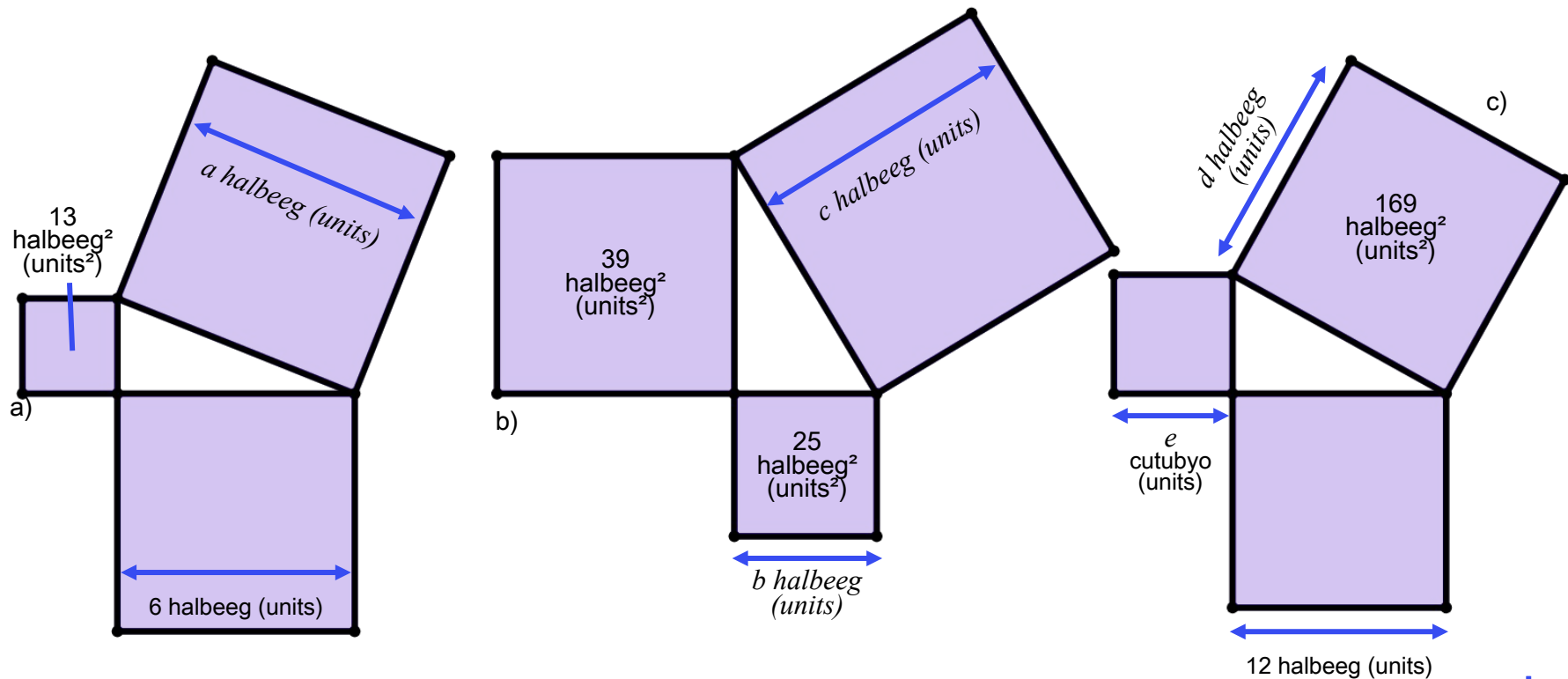
1) Saddexagal kasta oo xagal-qumman (right-angled triangle) ah, hel bedka (area) laba jibbaaran kasta oo aan calaamad lahayn.



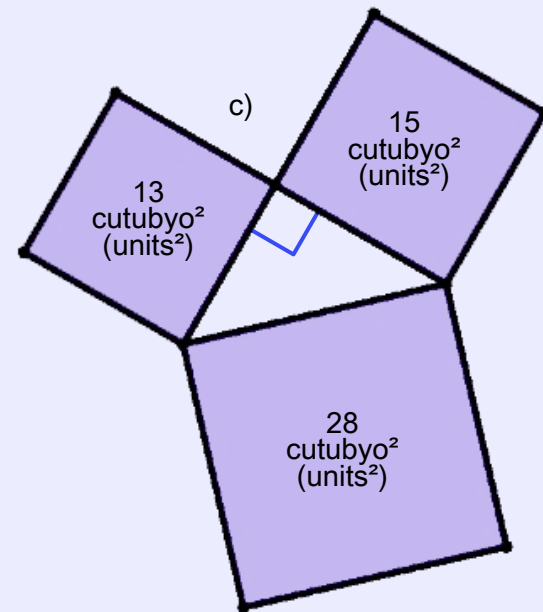
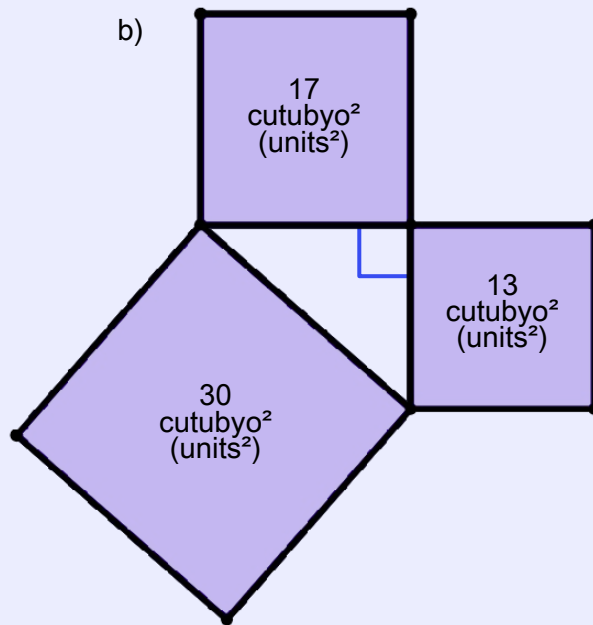
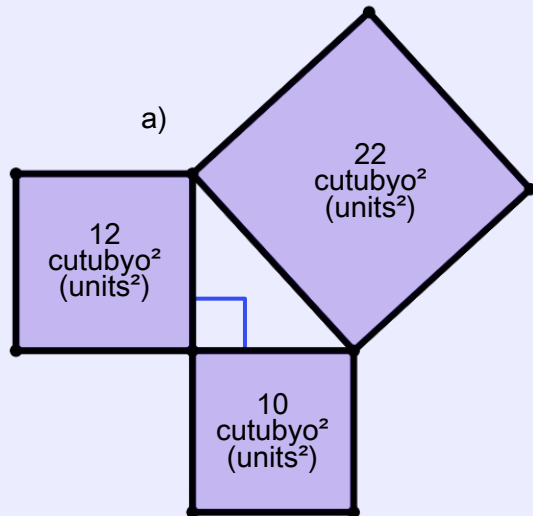
2) Saddexagal kasta oo xagal-qumman, hel bedka dhammaan labajibbaarannada.



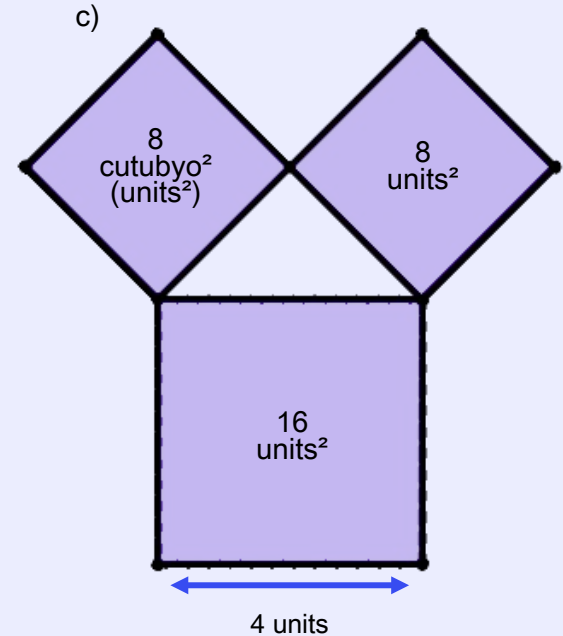
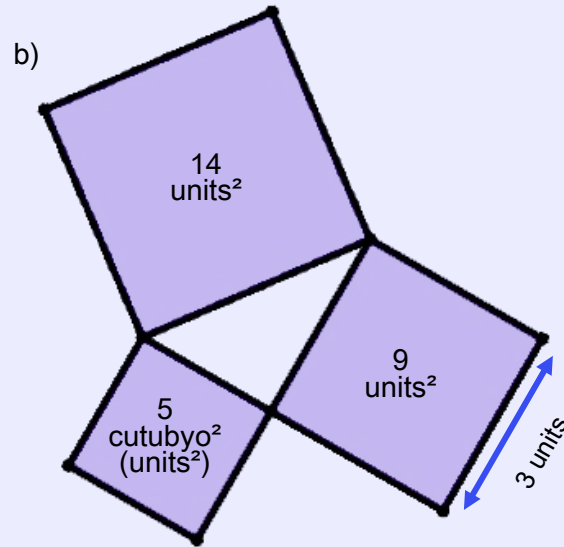
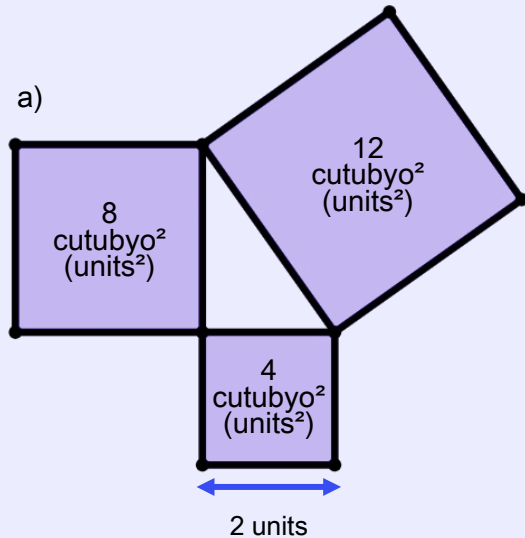
3) Saddexagal kasta oo xagal-qumman, buuxi bedka dhammaan labajibbaarannada oo hel dhererka maqan ee labajibbaaran kasta oo xaraf ku qoran.



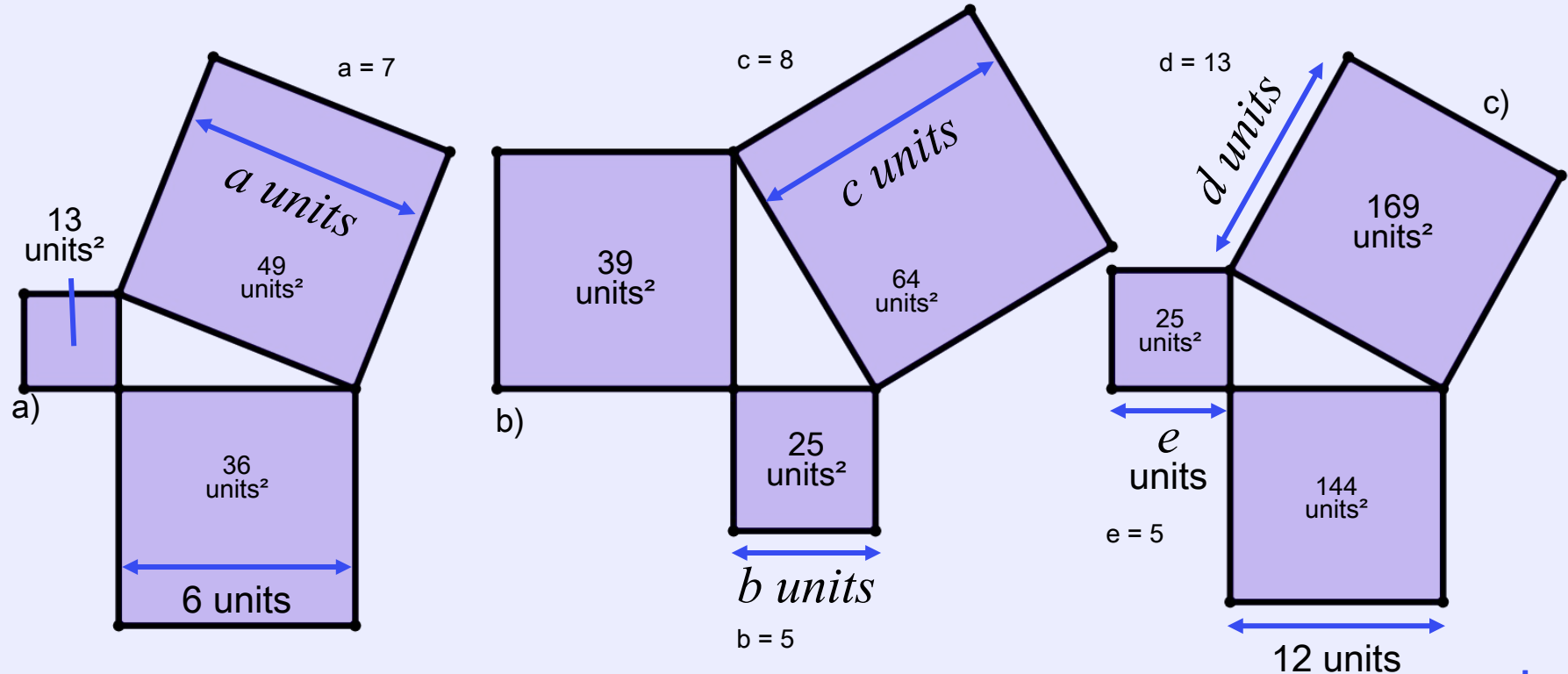
1) Saddex-xagal kasta oo qumman (right-angled), hel bedka (area) labajibbaaran kasta oo aan la calaamadayn.



2) Saddex-xagal kasta oo qumman (right-angled), hel bedka (area) dhammaan labajibbaaranada (squares).



3) Saddexagal kasta oo xagal-qumman, buuxi bedka (area) labajibbaaran kasta oo hel dhererka (length) maqan ee labajibbaaran kasta oo calaamad u leh xaraf.



Qaabka casharka

Si dheeri ah oo loo muujiyo aragtida (theorem) ee Pythagoras



Samaynta saddexagalka qumman (right-angled triangles) oo laga soo saaray labajibbaaranayaal (squares)

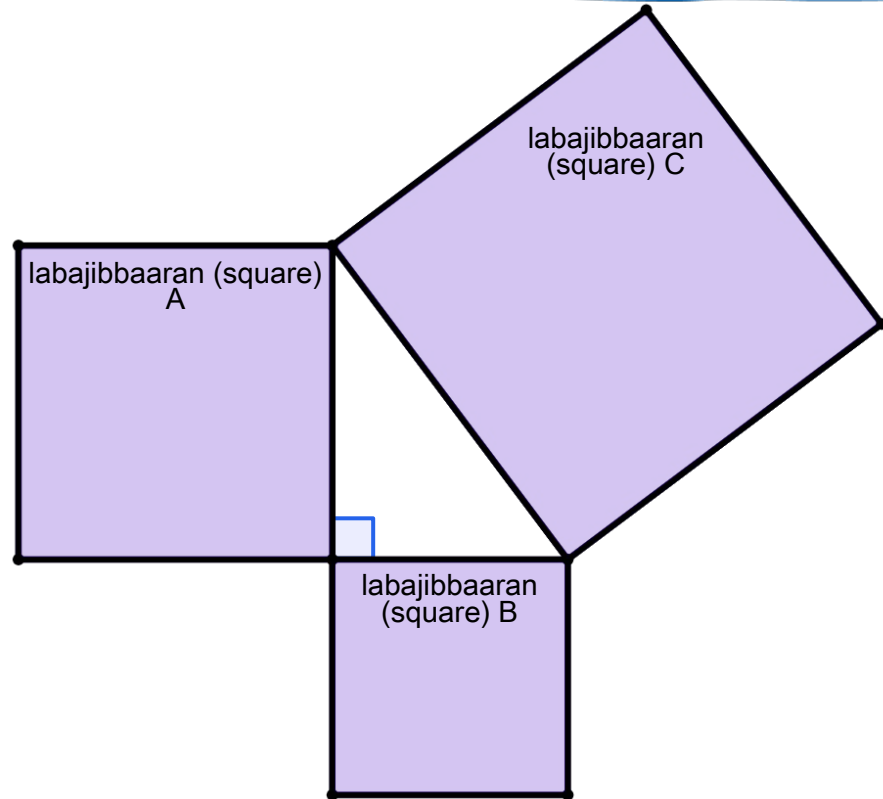


Soo bandhigida aragtida (theorem) ee Pythagoras

Waxaan u malaynayaa inaan hadda sameynay aragtida (theorem) ee Pythagoras.



Saciid





Saciid

Waxaan u malaynayaa inaan hadda sameynay aragtida (theorem) ee Pythagoras.

bedka (area) labajibbaaran (square) A + bedka (area) labajibbaaran (square) B = bedka (area) labajibbaaran (square) C

Laakiin waxay shaqeysaa oo kaliya haddii saddexda labajibbaaran (squares) ay sameeyaan saddexagal qumman (right-angled triangle).



Axmed

Sababtoo ah waxaan aragnay saddexagal (triangles) leh xaglo fidsan (obtuse angles) halkaas oo bedka (area) labajibbaaran (square) ugu weyn uu aad uga weyn yahay labada labajibbaaran (squares) ee kale!



Saciid

Waxaan u malaynayaa inaan hadda dhammaystirnay aragtida Pythagoras (Pythagoras' theorem).

bedka (area)
square A + bedka (area)
square B = bedka (area)
square C

Maxaan samaynaa haddii aynaan aqoon bedka (area) ee squares-ka?



Cabdi

Oh, Layla waxay tiri waxaan kaliya oo labajibbaarin karnaa dhererka (length) dhinaca square si aan u helno bedkiisa (area)!



Axmed

bedka (area)
square A + bedka (area)
square B = bedka (area)
square C

dhererka
(length)
dhinaca a oo
labajibbaaran

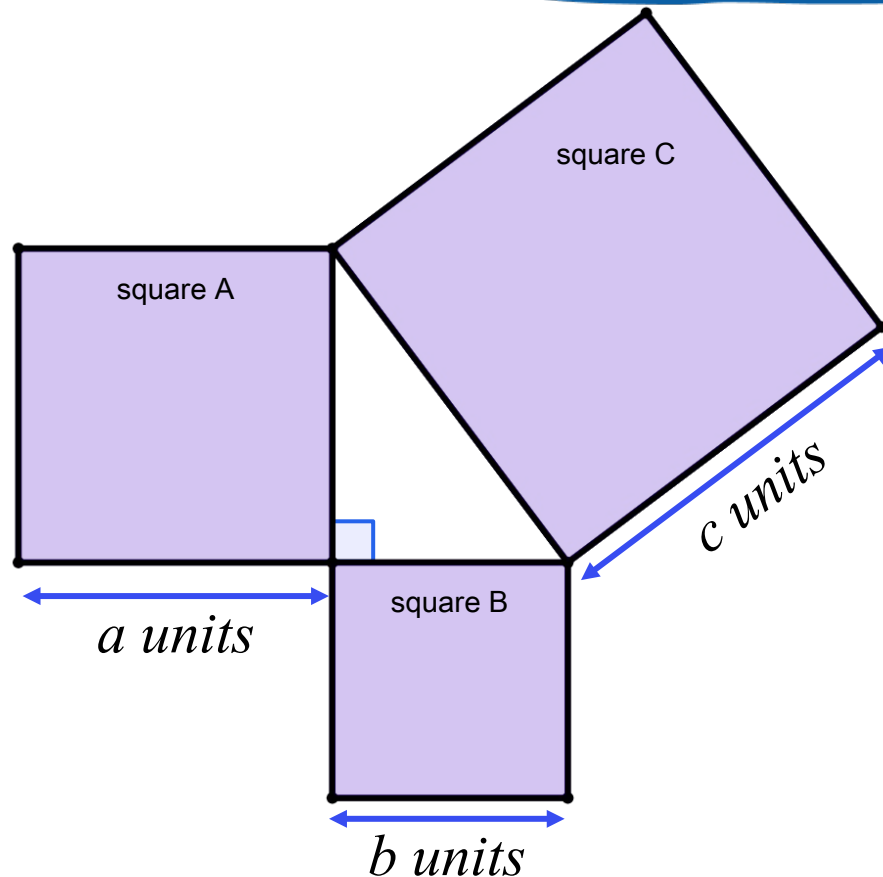
dhererka
dhinaca b
labajibbaaran
(length of side b
squared)

dhererka
dhinaca c
labajibbaaran
(length of side c
squared)

Marka, ma waxaan u qori karnaa aragtida Pythagoras (Pythagoras' theorem) sidan oo kale?



Saciid





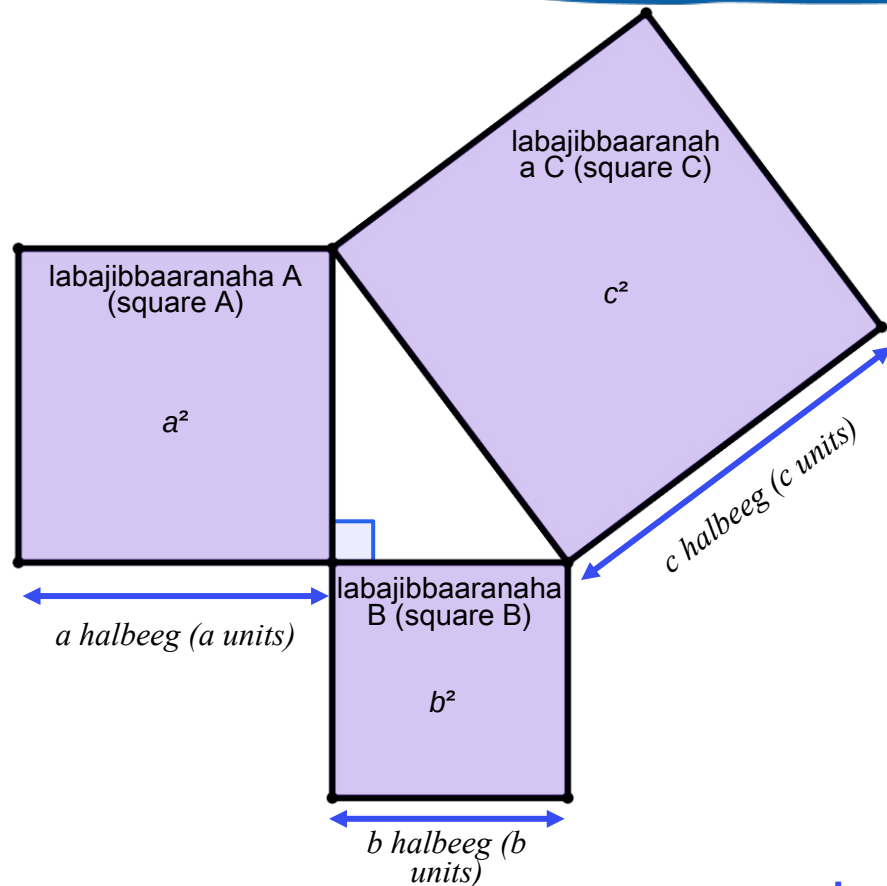
bedka
labajibbaaranah
a A (area of
square A) + bedka
labajibbaaranah
a B (area of
square B) = bedka
labajibbaaranah
a C (area of
square C)

$$a^2 + b^2 = c^2$$

Sug, waxaan maqlay aragtida Pythagoras ka hor,
miyaanay sidoo kale loo yaqaan tan?



Cabdi



bedka
labajibbaaranah
a A (area of
square A) + bedka
labajibbaaranah
a B (area of
square B) = bedka
labajibbaaranah
a C (area of
square C)

$$a^2 + b^2 = c^2$$

Sug, waxaan maqlay aragtida Pythagoras ka hor, miyaanay sidoo kale loo yaqaan tan?



Cabdi

Inta c^2 yahay bedka (area) labajibbaaranaha (square) ugu weyn, waxaan u malaynayaa inaad sax tahay!



Layla



Saciid

Marka, aragtida (theorem) Pythagoras sidoo kale waa tan?

$$a^2 + b^2 = c^2$$

Ma hubnaa inay tani u shaqeyso dhammaan saddexagalka (triangles) qumman (right-angled)?

Waxaan kaliya dhab ahaan muujinay inay u shaqeyso dhowr ka mid ah...



Cabdi

Waxaan hubaa inay jirto caddayn (proof) uu macallinku noo tusi karo oo u shaqeysa dhammaan saddexagalka (triangles) qumman (right-angled)!



Layla

Soo bandhigida aragtida (theorem) Pythagoras

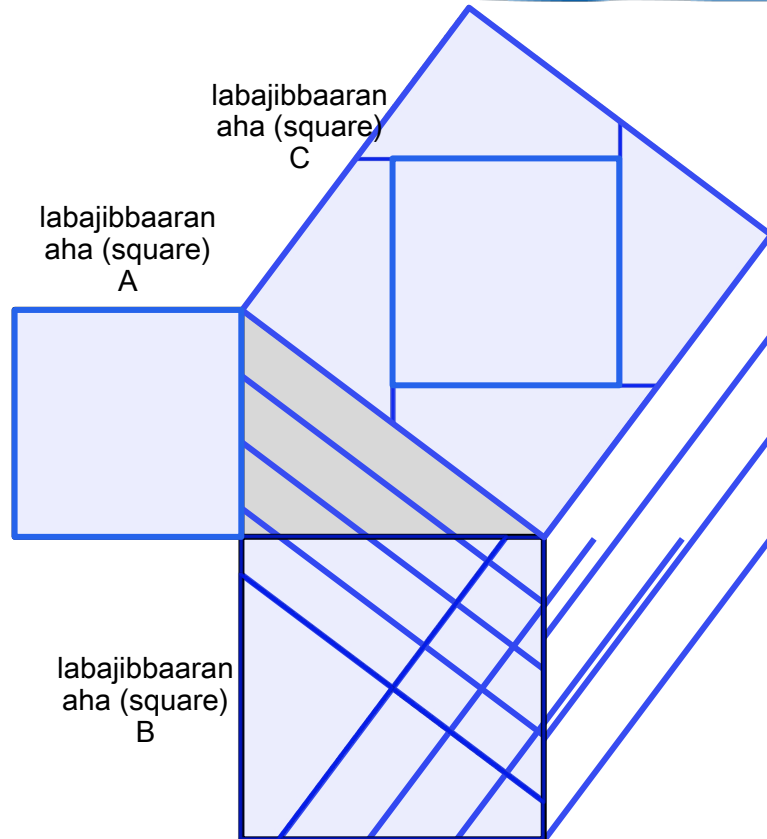


Sharaxaad

Bedka (area) labajibbaaranaha (square) A waa ka yar ama la eg bedka (area) labajibbaaranaha (square) B, iyo labajibbaaranaha (square) C waa kan ugu weyn.

Labajibbaaranaha (square) C wuxuu ka soo hor jeedaa xagal qumman (right-angle).

Sababtoo ah saddexagalka (triangle) ku xidhan saddexda labajibbaaranayaal (squares) waa saddexagal qumman (right-angled triangle), bedka (area) labajibbaaranaha (square) A iyo labajibbaaranaha (square) B waxay si fiican ugu habboon yihiin gudaha labajibbaaranaha (square) C.



Dooro weedha dhammays tira jumladan:

“Si aragtida (theorem) Pythagoras loo isticmaalo, waa inay saddex laba jibbaaran (squares) isku xirmaan si ay u sameeyaan _____”

a

laba jibbaaran (square) C, oo ah laba jibbaaran (square) ka ballaaran laba jibbaaran (squares) kale

b

c

saddex laba jibbaaran (squares) oo isku qaab (congruent)

 **d**

saddex xagal (triangle) qumman (right-angled)

Kuwee ka mid ah kuwan ayaa ah habab ku habboon oo lagu sharaxo aragtida (theorem) Pythagoras ee saddex laba jibbaaran (squares) oo isku xirma geesahooda (vertices) si ay u sameeyaan saddex xagal (triangle) qumman (right-angled)?



a

Wadarta bedka (area) labada laba jibbaaran (squares) ee yar waxay la mid tahay bedka (area) laba jibbaaran (square) weyn.



b

Laba jibaar (square) dhererka dhinac (side length) ee laba jibbaaran (square) kasta, ka dibna ku dar labada tiro ee yar. Wadartu waxay la mid tahay tiro (number) ugu weyn.



c

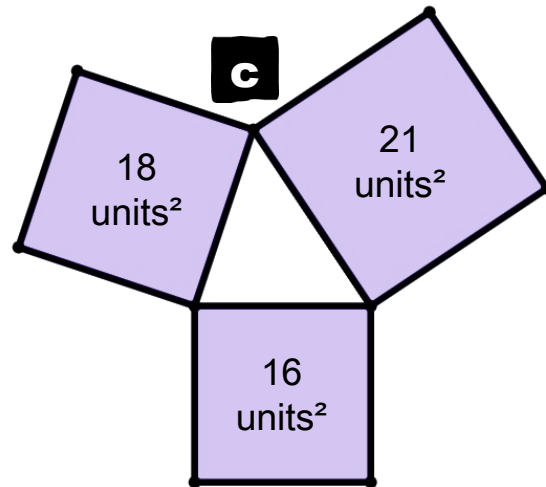
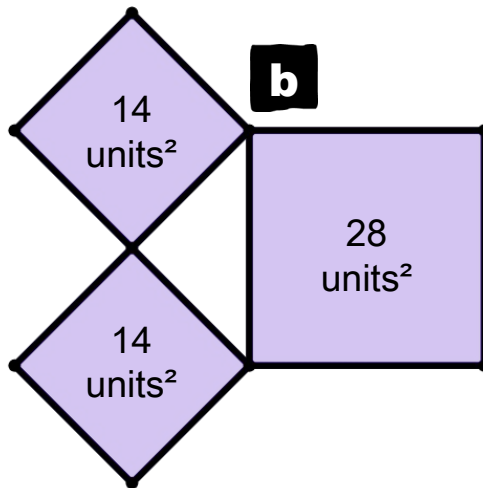
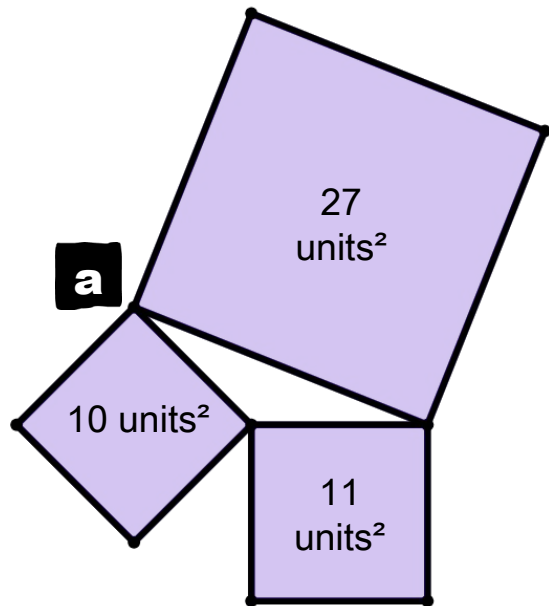
$$a^2 + b^2 = c^2$$



d

$$c^2 = b^2 + a^2$$

1) Jaantusyada (diagrams) kee ayaa aragtida (theorem) Pythagoras run ku tahay?



2) Sharax sababtaada su'aasha 1), maxayna kugu sheegaysaa saddexagalladaas (triangles)?

3) Kuwaas ka mid ah waa matalaad sax ah oo ah aragtida Pythagoras (Pythagoras' theorem) ee saddexda laba jibaaran (squares) ee ku xeeran saddexagal qumman (right-angled triangle)?

a

bedka (area) laba jibaaran (square) F oo lagu daro bedka (area) laba jibaaran (square) G waxay la mid tahay bedka (area) laba jibaaran (square) H

b

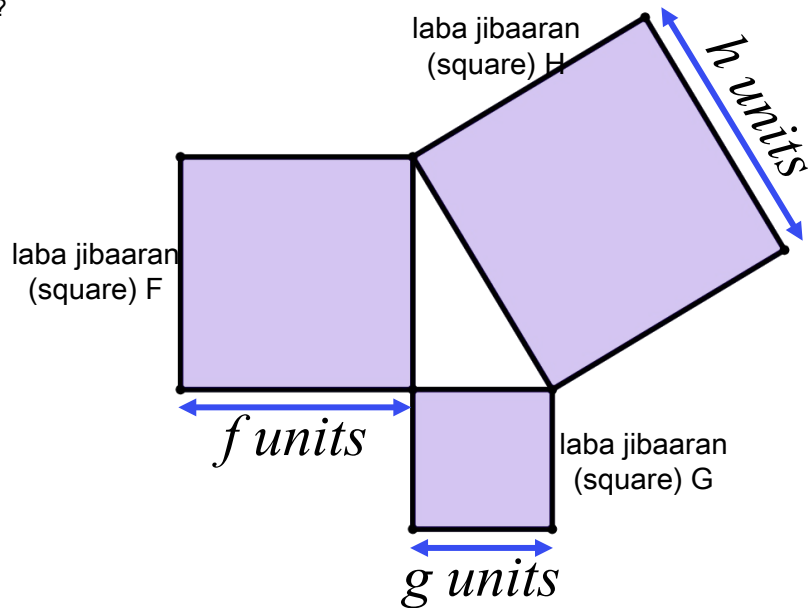
$$f^2 + g^2 = h^2$$

c

$$f^2 = g^2 + h^2$$

d

$$h^2 = g^2 + f^2$$



Hawsha B

Soo bandhigida aragtida Pythagoras (Pythagoras' theorem)



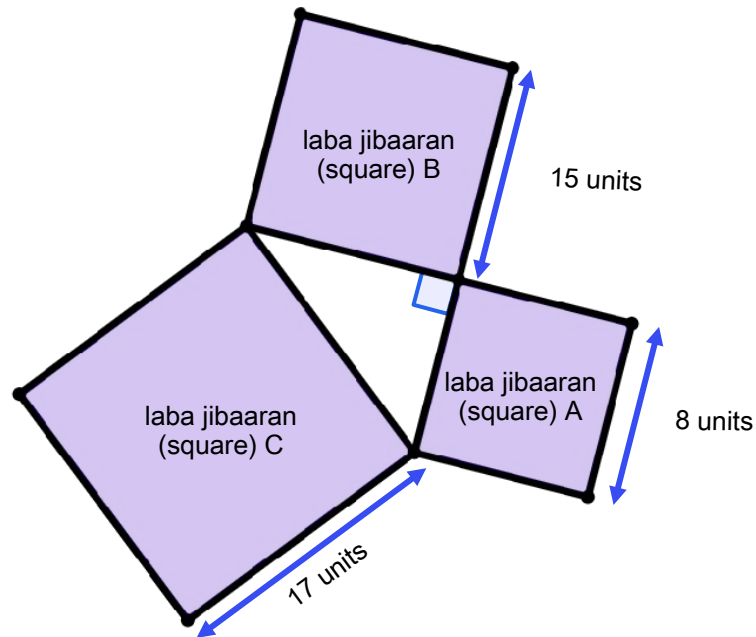
4) a) Maxay 15' u taagan tahay jantuskan?

b) Waa maxay bedka (area) laba jibaaran (square) ugu weyn?

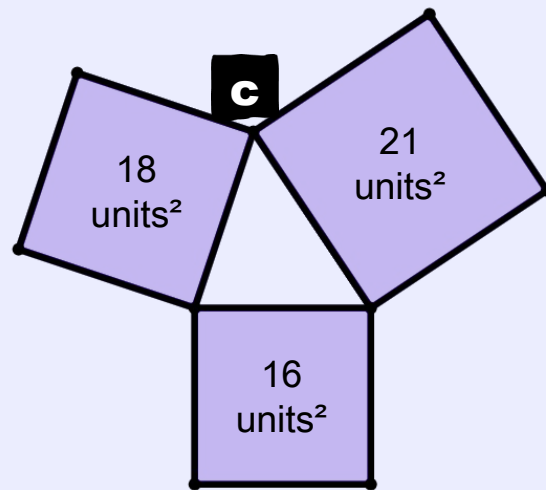
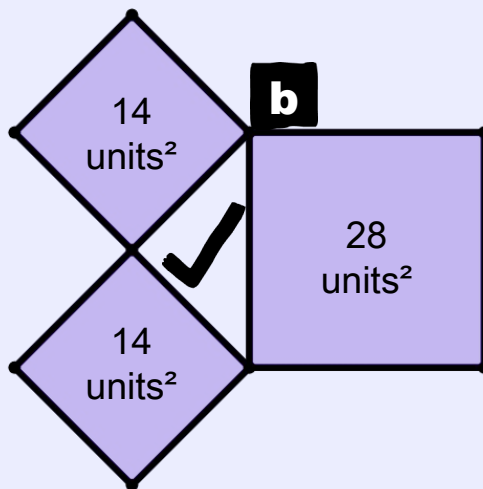
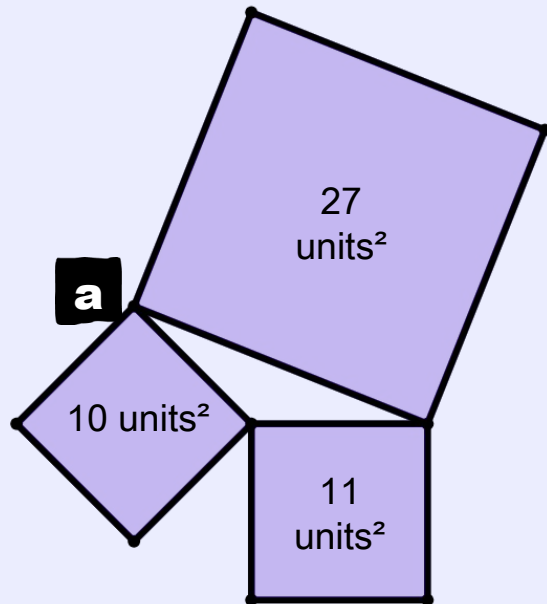
c) Buuxi meelaha barnaan ee xisaabinta aragtida Pythagoras (Pythagoras' theorem).

$$\square^2 + \square^2 = \square^2$$

$$\text{bedka (area) laba jibaaran (square) A} + \text{bedka (area) laba jibaaran (square) B} = \text{bedka labajibbaaranaha C (area of square C)}$$



1) Jaantusyadee ayaa aragtida Pythagoras (Pythagoras' theorem) run ku tahay?



2) Sharax sababtaada su'aasha 1).

b waa jaantuska kaliya ee wadarta labada bed ee yar ay la mid tahay bedka weyn. Kani waa saddex-xagalka qumman (right-angled triangle) kaliya.

3) Kuwee ka mid ah kuwan ayaa ah matalaad sax ah oo aragtida Pythagoras (Pythagoras' theorem) ah oo ku saabsan saddexda labajibbaaran ee ku xeeran saddex-xagalka qumman (right-angled triangle)?

a

bedka labajibbaaranaha F (area of square F) oo lagu daray
bedka labajibbaaranaha G (area of square G) wuxuu
mid yahay bedka labajibbaaranaha H (area of square H)

b

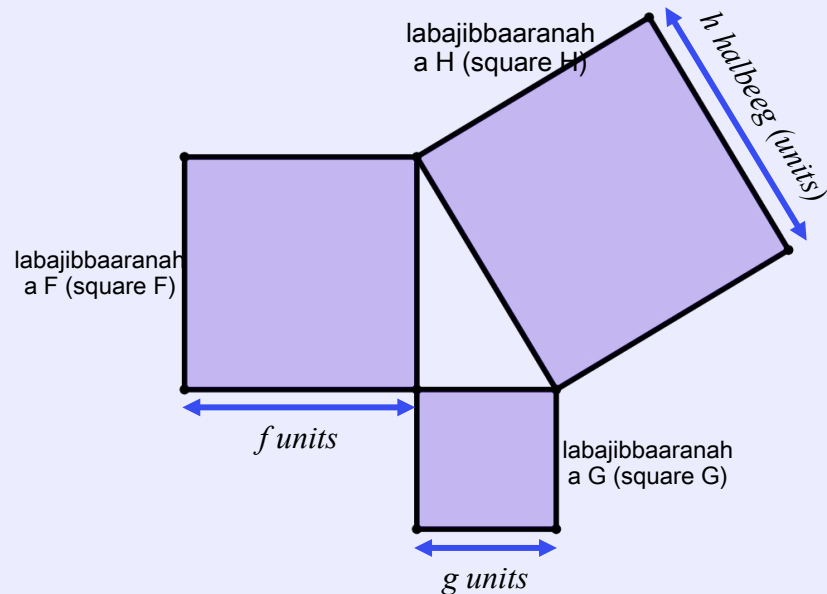
$$f^2 + g^2 = h^2$$

c

$$f^2 = g^2 + h^2$$

d

$$h^2 = g^2 + f^2$$



4) a) Maxay 15² ku matali kartaa jaantuskan?

b) Waa maxay bedka (area) labajibbaaranaha (square) ugu weyn?

c) Buuxi meelaha barnaan ee xisaabinta aragtida (theorem) Pythagoras.

15² waa bedka (area) labajibbaaranaha (square)
B

Labajibbaaranaha (square) C wuxuu leeyahay bed (area) 289 halbeeg²
(units²)

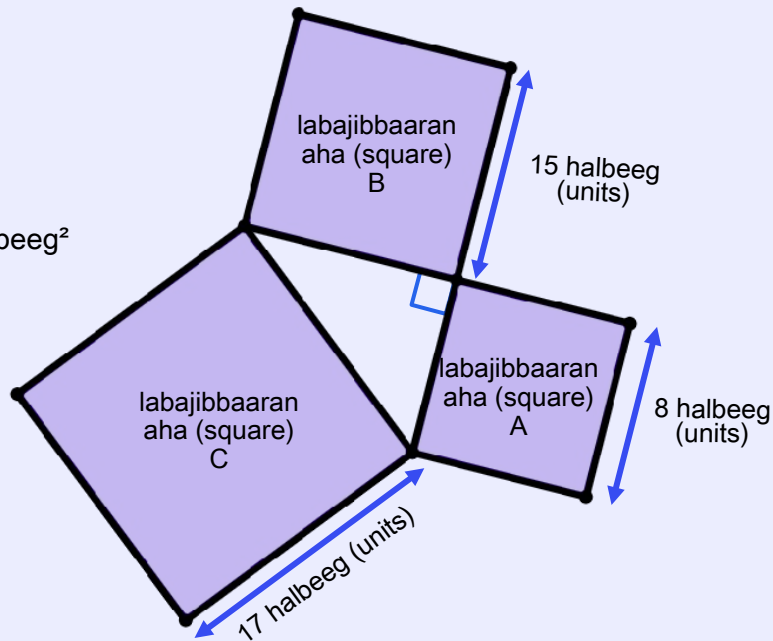
$$\boxed{8}^2 + \boxed{15}^2 = \boxed{17}^2$$

$$\boxed{64} + \boxed{225} = \boxed{289}$$

bedka (area)
labajibbaaranah
a (square) A

bedka (area)
labajibbaaranah
a (square) B

bedka (area)
labajibbaaranah
a (square) C



Soo koobid

Tusmo dheeri ah oo ku saabsan aragtida (theorem) Pythagoras

Saddex labajjibaarane (squares) ayaa lagu xiri karaa meelaha ay isku xigaan si ay u sameeyaan saddexagal (triangle).
Haddi saddex labajjibaarane (squares) isku mid ah la xiro, saddexagalku (triangle) waa siman (equilateral).
Haddi laba labajjibaarane (squares) isku mid ah la xiro, saddexagalku (triangle) waa laba-simane (isosceles).
Haddi dhammaan labajjibaaranayaasha (squares) ay leeyihiin bed (areas) kala duwan, saddexagalku (triangle) waa kala-dhigma (scalene).

Xagasha (angle) ugu weyn ee saddexagalka (triangle) waxay noqon kartaa mid fiican (acute), qumman (right), ama fidsan (obtuse). Iyadoo ku xiran haddii wadarta bedka (areas) labada labajjibaarane (squares) yar ay ka weyn tahay, la mid tahay, ama ka yar tahay bedka (area) labajjibaaranaha (square) ugu weyn, siday u kala horreeyaan.

Marka wadarta bedka (areas) labada labajjibaarane (squares) yar ay la mid tahay bedka (area) labajjibaaranaha (square) ugu weyn, saddexagalku (triangle) had iyo jeer waa saddexagal (triangle) xagal-qumman (right-angled). Tani waa muujin muuqaal ah oo ku saabsan aragtida (theorem) Pythagoras.