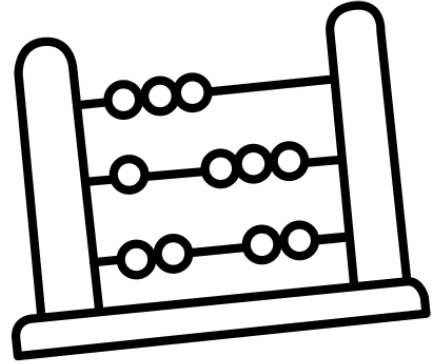


Natijoooyin isku mid ah (Equally likely outcomes)

Maths

Cutub: Itimaalka (Probability): natijoooyinka suurtagalka ah



Natiijo

Waxaan sheegi karaa marka natiijooyinku ay isku mid yihiin (equally likely).

Erayada muhiimka ah

Tijaabo (trial) waa imtixaan hal qeexan.

Natiijo (outcome) waa natijada tijaabo.

Meel muunad (sample space) waa dhammaan natiiyooyinka suurtagalka ah ee tijaabo (trial). Jaantuska meesha muunadku waa hab nidaamsan oo lagu soo saaro meesha muunadka.

Itimaal (likelihood) wuxuu qeexaa fursadda dhacdo gaar ah inay dhacdo.

Natiijooyin isku mid ah (Equally likely outcomes)



Liis garaynta natiijooyinka suurtagalka ah



Aqoonsiga marka laba natijood ay isku mid yihiin (equally likely)



Aqoonsiga in ka badan laba natijood oo isku mid ah

Darsigan wuxuu eegi doonaa xaalado ay jiraan waxyaabo kala duwan oo suurtagal ah inay dhacaan.

Xaaladahan waxaa looga hadli karaa iyadoo la adeegsanayo erayadan:

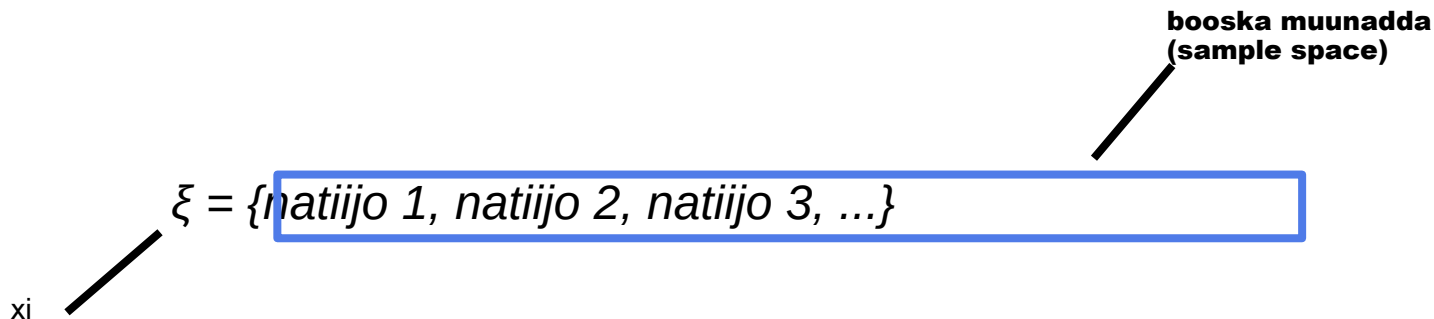
- Tijaabo (trial) waa imtixaan hal qeexan (tusaale: wareejin hal mar, rogrogasho saddex jeer, tartan dhowr orodya.
- Natiijo (outcome) waa natiijada tijaabo.
- Meel muunad (sample space) waa dhammaan natiijooyinka suurtagalka ah ee tijaabo.

Dhammaan natiijooyinka suurtagalka ah ee tijaabo waxaa loo qori karaa iyadoo la adeegsanayo calaamaddan:

$$\xi = \{\text{natiijo 1, natiijo 2, natiijo 3, ...}\}$$

xi

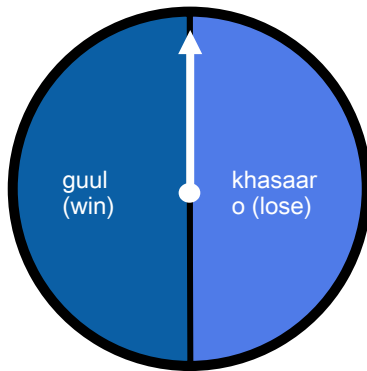
booska muunadda
(sample space)



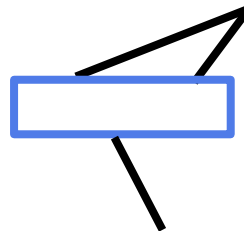
Xarafka Giriigga ξ (xi) waxaa loo isticmaalaa guud ahaan calaamad u taagan 'goob guud' (universal set). Marka la eego mawduucan, waxaa loo isticmaalaa inuu matalo dhammaan natiijooyinka suurtagalka ah ee tijaabo.

Yacquub wuxuu ku wareejin doonaa wareejiyaha (spinner) hal mar. Waa maxay natiijooyinka suurtagalka ah?

Wareejiyuhu wuxuu ku degi karaa guul ama khasaaro.



tijaabo (trial): hal wareejin oo wareejiyaha ah

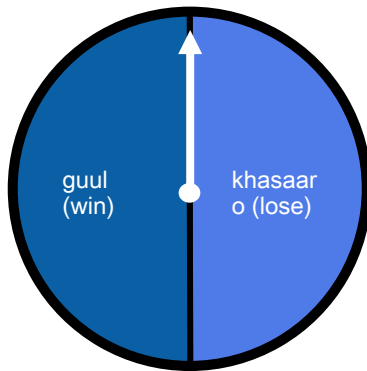


Yacquub wuxuu ku wareejin doonaa wareejiyaha hal mar. Waa maxay natiijooyinka suurtagalka ah?

Wareejiyuhu wuxuu ku degi karaa guul ama khasaaro.



Maya, ma aha mid ka mid ah natiijooyinka suurtagalka ah. Sidaa darteed 'barbar dhig' kuma jiro booska muunadda.



Ma suurtagal baa in lala barbar dhigo (draw) wareejiyahan?



$\xi = \{guul, khasaaro\}$

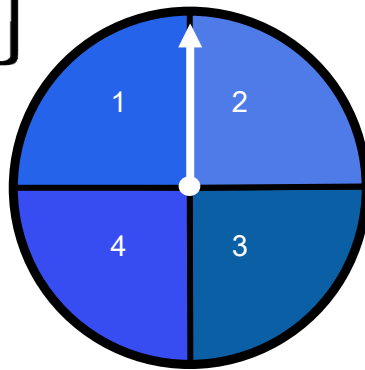
Nuur

Isra waxay u wareegi doontaa wareegga hal mar. Waa maxay natiiyooyinka suurtagalka ah?

Wareejiyuhu wuxuu ku degi karaa 1, 2, 3 ama 4.



1 waa lambar cube (cube number) waana ku jiraa meesha muunadda (sample space). Haddaba haa, lambar cube waa natiiyo suurtagal.



Ma suurtagal in lagu helo lambar cube (cube number) wareeggan?



Nuur

tijaabo: hal wareeg oo wareegga ah

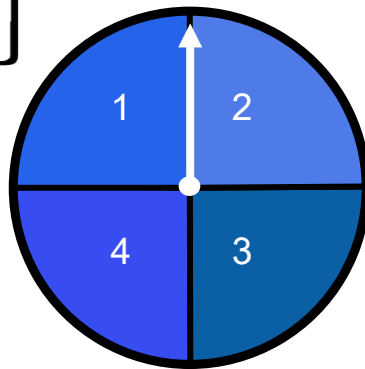
$$\xi = \{1, 2, 3, 4\}$$

Isra waxay u wareegi doontaa wareegga hal mar. Waa maxay natiiyooyinka suurtagalka ah?

Wareeggu wuxuu ku degi karaa 1, 2, 3 ama 4.



Maya, ma jiraan lambarro taban (negative numbers) gudaha meesha muunadda (sample space). Sababtoo ah ma aha natiiyooyin suurtagal.



Ma suurtagal in lagu helo lambar taban (negative number) wareeggan?



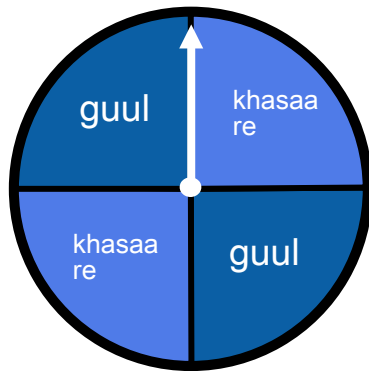
Nuur

tijaabo: hal wareeg oo wareegga ah

$$\xi = \{1, 2, 3, 4\}$$

Axmed iyo Suad waxay tixgelinayaan meesha muunadda (sample space) ee tijaabo ka kooban hal wareeg oo wareeggan ah.

Waxaan u malaynayaa inay jiraan afar natiiyo oo suurtagal.

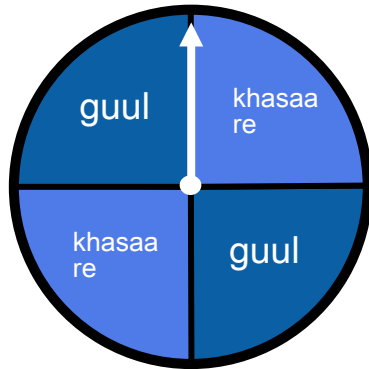


Waxaan u malaynayaa inay jiraan laba natiiyo oo suurtagal.



Yaa aad la raacsan tahay?

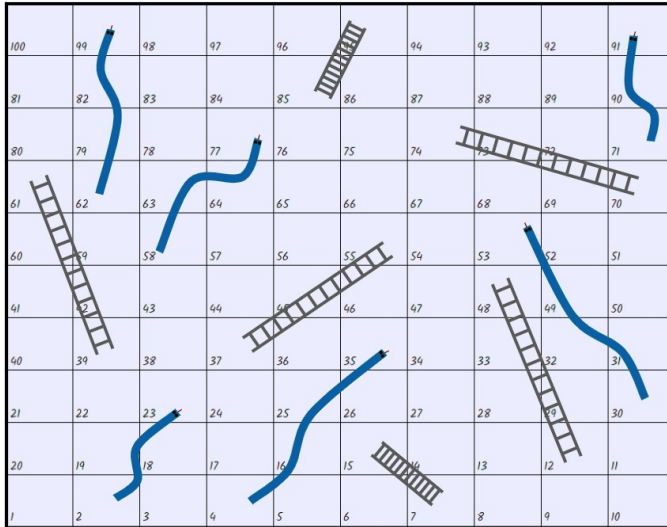
Natiijooyinka kaliya ee suurtagalka ah ee wareeggan waa 'guul' iyo 'khasaa re'. Waxaa jira qaybo badan oo wareegga ah oo leh natiijo kasta, laakiin meesha muunadda (sample space) waxay ka kooban tahay laba natiijo oo kala duwan.



Qorista natiijooyinka suurtagalka ah

Waxa ku jira meel muunad (sample space) waxay ku xiran tahay waxa loo qeexay tijaabo (trial) macnaha gaarka ah, sababtoo ah tani waxay saameyn ku yeelataa natiijooyinka suurtagalka ah.

Tusaale: Caasha, Cabdi iyo Saciid waxay ciyaari doonaan ciyaar sabuuraad (board game).



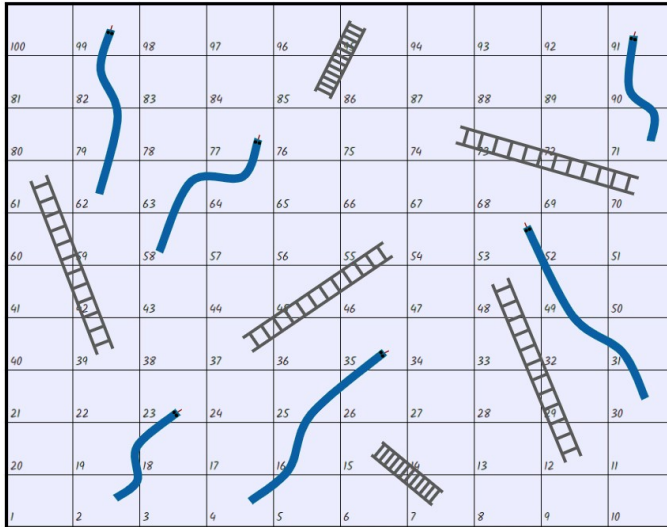
Halkan tijaabo (trial) waxaa lagu qeexay rogista dhagaxa (dice). Natiijooyinka suurtagalka ah waa tirooyinka dhagaxa, marka meesha muunaddu (sample space) waa:

$$\xi = \{1, 2, 3, 4, 5, 6\}$$

Qorista natiijooyinka suurtagalka ah

Waxa ku jira meel muunad (sample space) waxay ku xiran tahay waxa loo qeexay tijaabo (trial) macnaha gaarka ah, sababtoo ah tani waxay saameyn ku yeelataa natiijooyinka suurtagalka ah.

Tusaale: Caasha, Cabdi iyo Saciid waxay ciyaari doonaan ciyaar sabuuraad (board game).



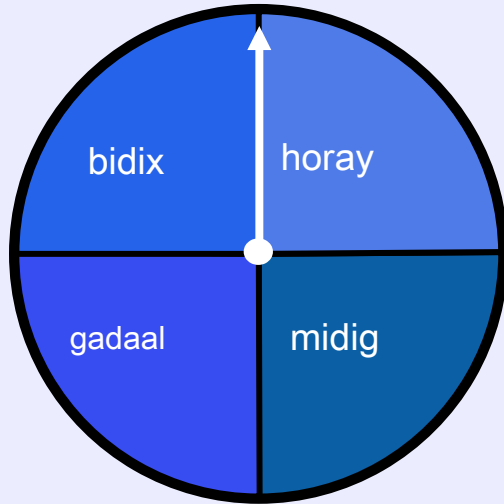
Haddii tijaabo (trial) lagu qeexo ciyaar, markaas natiijooyinku waa kuwa guuleysta ee suurtagalka ah. Meesha muunaddu (sample space) waa:

$$\xi = \{Caasha, Cabdi, Saciid\}$$

Qorista natiijooyinka suurtagalka ah

Tijaabo (trial) waa hal wareeg oo ah wareegga hoose (spinner).

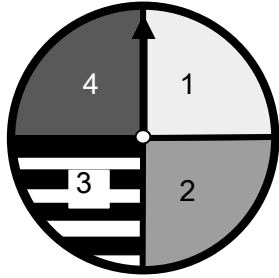
Qor meesha muunadda (sample space) tan.



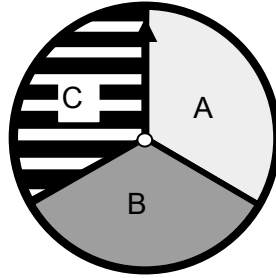
$$\xi = \{gadaal, horay, bidix, midig\}$$

1) Su'aal kasta, tijaabo (trial) waa hal wareeg oo wareegiyaha (spinner) ah. Qor booska muunadda (sample space) tijaabo kasta.

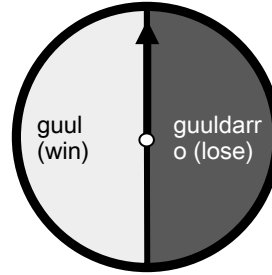
a)



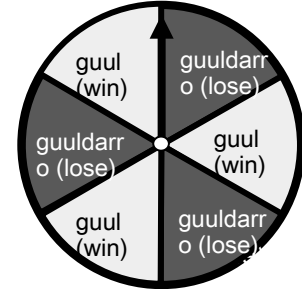
b)



c)

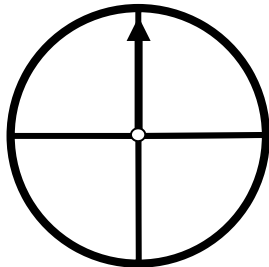


d)



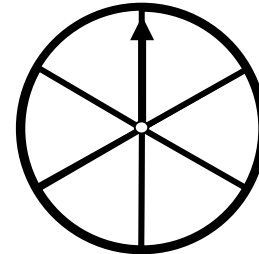
2) Su'aal kasta, tijaabo (trial) waa hal wareeg oo wareegiyaha (spinner) ah. Isticmaal boosaska muunadda (sample spaces) si aad u dhamaystirto wareegiyaha. Waxaa jiri kara in ka badan hal jawaab suurtagal ah.

a)



$$\xi = \{A, B, C, D\}$$

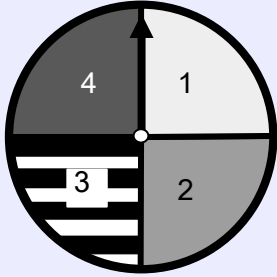
b)



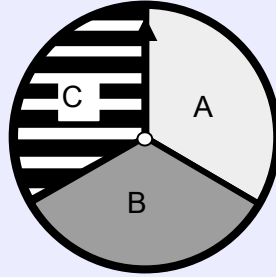
$$\xi = \{A, B, C, D\}$$

1) Su'aal kasta, tijaabo (trial) waa hal wareeg oo wareegiyaha (spinner) ah. Qor booska muunadda (sample space) tijaabo kasta.

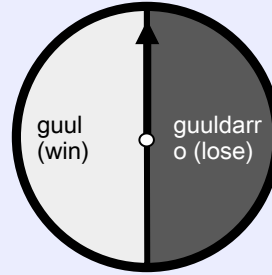
a)



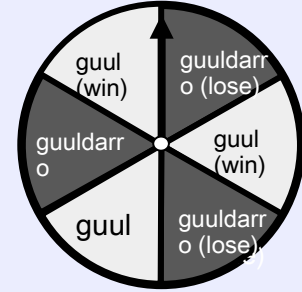
b)



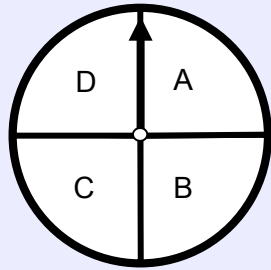
c)



d)



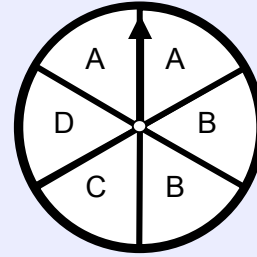
2) Su'aal kasta, tijaabadu waa hal wareeg oo wareegiyaha ah. Isticmaal boosaska muunadda (sample spaces) si aad u dhamaystirto wareegiyaha. Waxaa laga yaabaa inay jiraan wax ka badan hal jawaab oo suurtagal ah.



$$\xi = \{A, B, C, D\}$$

Fiiro: xuruufta waxay noqon karaan nidaam kasta.

b)



Fiiro: xuruufta mid kasta waa lagu celin karaa tiro kasta, illaa iyo inta afarta xuruufood oo dhan ay joogaan.

Jawaabaha:

a) $\xi = \{A, B, C, D\}$

Natiijooyin isku egtahay (Equally likely outcomes)



Liiska natiijooyinka suurtagalka ah

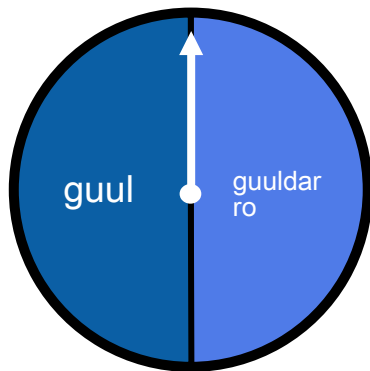


Garashada marka laba natiijo ay isku egtahay (equally likely)



Garashada in ka badan laba natiijo oo isku egtahay

Yacquub wuxuu ku wareejinayaa hal wareegiyaha hal mar. Haddii wareegiyuhu ku soo degto 'guul', wuxuu helayaa abaalmarin.

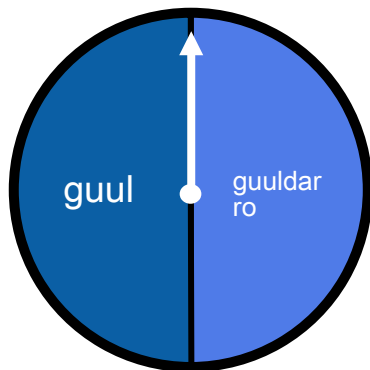


Mid ka mid ah wareegiyahan uma eka mid caddaalad ah.

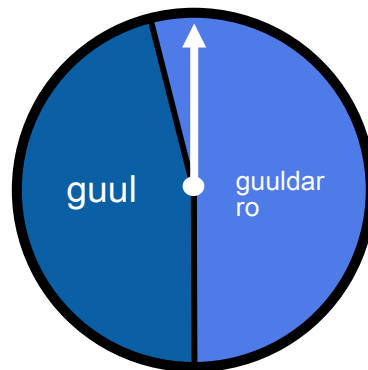
Wareegiyee kee u ekaa mid aan caddaalad ahayn? Sabab?

Isku egtahay (Likelihood) waxay qeexaysaa fursadda in dhacdo gaar ah ay dhacdo.

Wareegga bidix, qaybaha 'guul' iyo 'guuldarro' waa isku cabbir. Suurtogalnimada in fallaarta ku degto qaybta 'guul' waa la mid taa 'guuldarro'. Marka natiiyooyinkani waa isku suurto gal (equally likely).



natiijooyin isku suurto gal (equally likely outcomes)



natiijooyin aan isku suurto gal ahayn (non-equally likely outcomes)

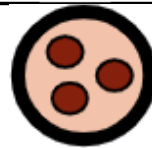
Axmed iyo Suad waxay isku dayayaan inay go'aamiyaan cidda helaya buskudka ugu dambeeya ee dhalada ku jira.

Waxay go'aansadeen inay rolaan dice (six-sided dice) caadi ah si ay u go'aamiyaan cidda helaya.

$$\xi = \{Axmed, Suad\}$$



Haddii aan rolo tiro ka tirsan 3 (multiple of 3), adiga ayaa heli kara buskudka. Haddii aysan ahayn tiro ka tirsan 3, aniga ayaa heli doona.



Ma waa caddaalad? Natiijooyinku ma yihiin isku suurto gal?

Maya

Cabdi iyo Nuur waxay isku dayayaan inay go'aamiyaan cidda helaysa buskudka ugu dambeeya ee dhalada ku jira.

Waxay go'aansadeen inay rolaan dice (six-sided dice) caadi ah si ay u go'aamiyaan cidda helaysa.

$$\xi = \{Cabdi, Nuur\}$$

Haddii aan rolo tiro siman (even number), adiga ayaa heli kara buskudka. Haddii ay tahay tiro aan simanayn (odd number), aniga ayaa heli doona.



Ma waa caddaalad? Natiijooyinku ma yihiin isku suurtoagal?

Haa

Caasha waxay rogaysaa qadaadiic (coin) cad oo qoraysa 'madax' ama 'dhab'.

Waxay hore u rogtay sagaal jeer. Waa kuwan natiijooyinkii:

dhab, dhab, madax, dhab, dhab, madax, madax, madax, madax

Waxay u dhowdahay inay mar kale rogto qadaadiicda oo ay tixgeliso waxa ay filaysaa inay dhacaan.



Waxaa muddo ah markii ugu dambeysay ee 'tails' soo baxday, marka waxaan qiyaasayaa in rogashada xigta ay noqon doonto 'tails'.

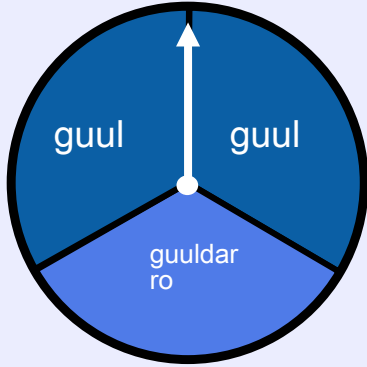
Maxaa qaldan oo ka jira sababaynta Caasha?

Laba natiijo ee suurtoogalka ah had iyo jeer waa isku egtahay inay dhacaan (equally likely) oo kuma xirna natiijooyinkii hore.

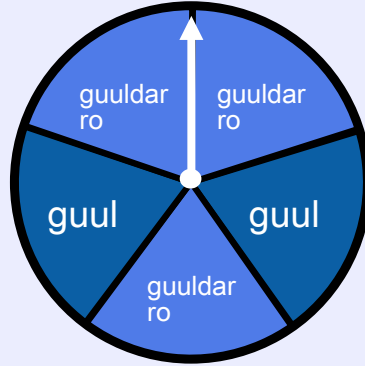


Garashada marka laba natiijo ay isku egtahay inay dhacaan (equally likely)

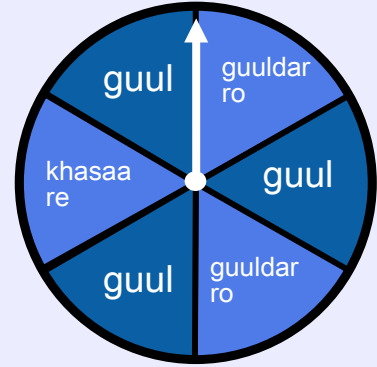
Wareegte (spinner) kee ayaa natiijooyinka 'guul' iyo 'guuldarro' ay isku egtahay inay dhacaan?



a



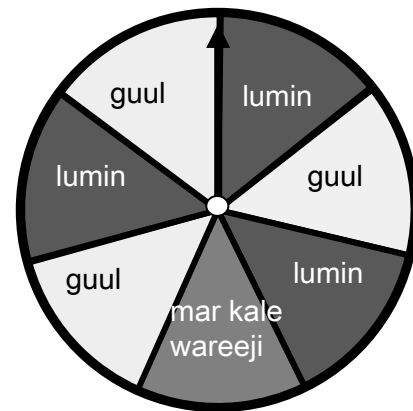
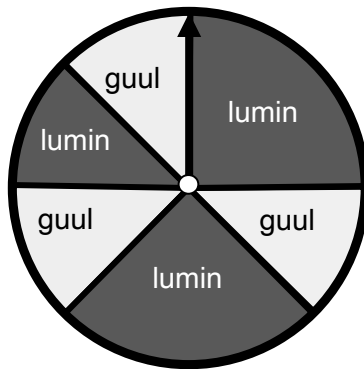
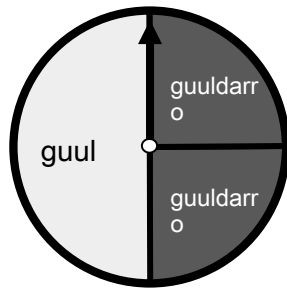
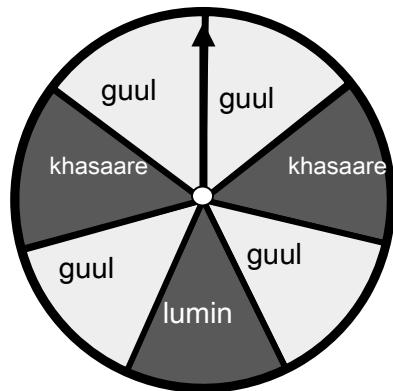
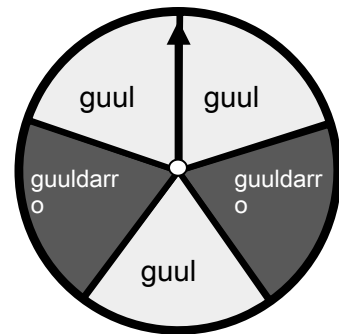
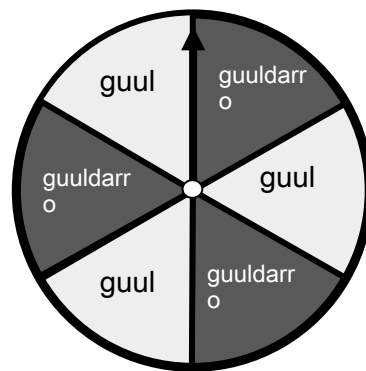
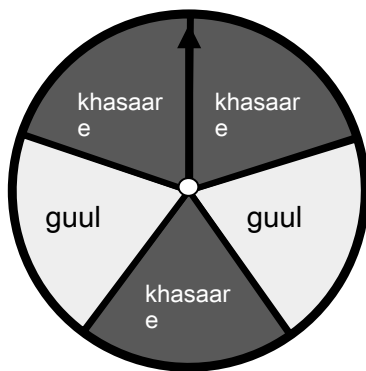
b



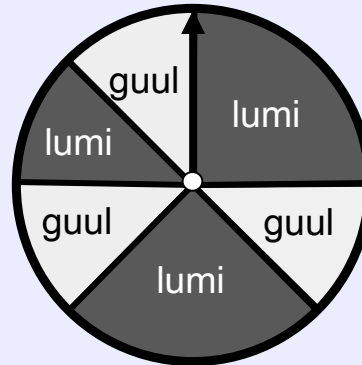
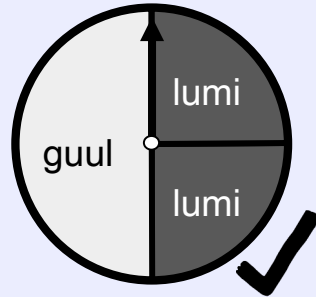
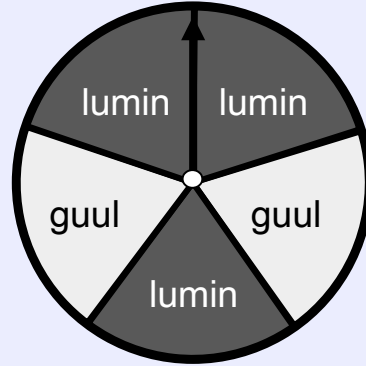
c



1) Calaamadee (tick) spinners-ka halkaasoo natiijooyinka 'guul' iyo 'khasaare' ay isku ekaadaan (equally likely).



1) Calaamadee spinners-ka halka natiijooyinka 'guul' iyo 'lumin' ay yihiin kuwo isku mid ah.



Qaabka casharka

Natiijooyin isu eg (Equally likely outcomes)



Taxanayaal natiijooyinka suurtagalka ah

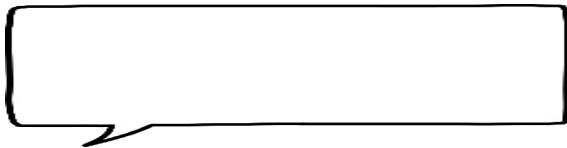


Gartashada marka laba natiijo ay isku ekaadaan suurtagalnimada



Gartashada in ka badan laba natiijo oo isku ekaada suurtagalnimada

Raffle samafal ayaa qof kasta siinaya lambar 1 ilaa 100. Lambar ayaa si kadis ah looga soo xulayaa sanduuq, qofka lambarkaas haysta ayaa guuleysta.

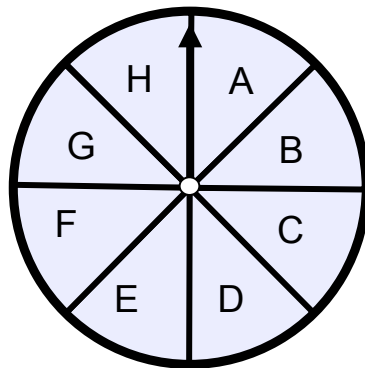


May! Waxaan haystaa lambarka 1. Taas weligeed lama soo xuli doono!

Nuur ayaa u badan inuu guuleysto aniga, sababtoo ah wuxuu haystaa lambar dhexda ah.

Lambar kasta waxaa si isu eg loo soo xuli karaa, iyadoon loo eegin cabirkiisa.

Cali wuxuu ku wareejinayaa wareegga hal mar. Ma waxay natiijooyinka oo dhami u dhacaan si isu eg?

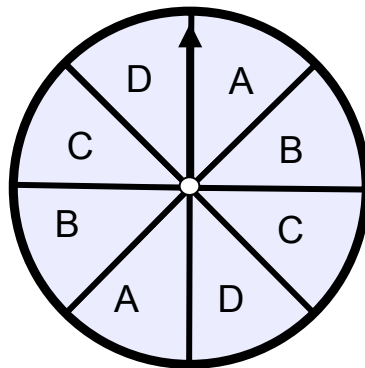


tijaabo: hal wareejin oo wareegga ah

$$\xi = \{A, B, C, D, E, F, G, H\}$$

Qaybaha oo dhami waa isku cabbir, waxaana jira hal qayb xaraf kasta.
Sidaas darteed haa, natiijooyinku waxay u dhacaan si isu eg.

Cali wuxuu ku wareejinayaa wareegga hal mar. Ma waxay natiijooyinka oo dhami u dhacaan si isu eg?



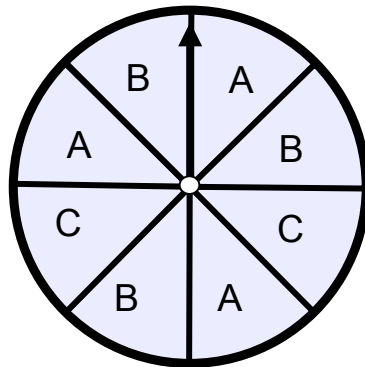
tijaabo: hal wareejin oo wareegga ah

$$\xi = \{A, B, C, D\}$$

Qaybaha oo dhami waa isku cabbir, waxaana jira laba qaybood xaraf kasta. Sidaas darteed haa, natiijooyinku waxay u dhacaan si isu eg.

Aqoonsashada in ka badan laba natiijo oo isu eg

Andeep wuxuu u wareegi doonaa wareegga hal mar. Ma waxaa dhammaan natiijooyinka ay u dhacayaan si isku mid ah?



tijaabo: hal wareeg oo wareegga

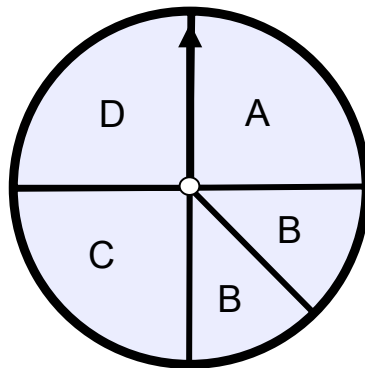
$$\xi = \{A, B, C\}$$

Qaybaha oo dhami waa isku cabbir. Waxaa jira qaybo ka yar oo leh xarafka C marka loo eego A ama B.

Marka maya, natiijooyinka isku mid kuma dhacaan.

Aqoonsiga in ka badan laba natiijo oo isku mid ah

Andeep wuxuu u wareegi doonaa wareegga hal mar. Ma waxaa dhammaan natiijooyinka ay u dhacayaan si isku mid ah?



tijaabo: hal wareeg oo wareegga

$$\xi = \{A, B, C, D\}$$

Waxaa jira qaybo badan oo B ah marka loo eego xarfaha kale, laakiin qaybaha B waa kuwa yaryar. Qayb kasta oo weyn waxay la mid tahay laba qaybood oo yaryar. Marka haa, natiijooyinka waa isku mid.

Aqoonsiga in ka badan laba natiijo oo isku mid ah



Run mise been?

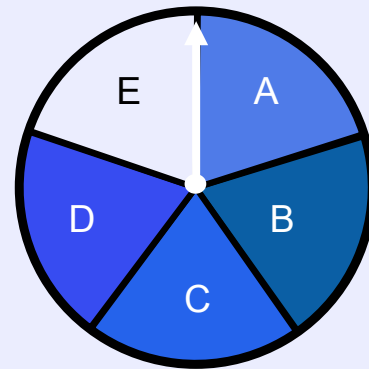
Natiijooyinka kala duwan ee wareeggan waxay u dhacaan si isku mid ah.



Run



Been



Sabab u sheeg jawaabtaada

a

Qaybaha dhammaantood waa isku cabbir, waxaana jira tiro isku mid ah oo qaybo ah xaraf kasta.



b

Xarfaha qaarkood way adag tahay in laga helo wareegga marka loo eego kuwa kale.

Aqoonsiga in ka badan laba natiiyo oo isku mid ah

Run mise been?

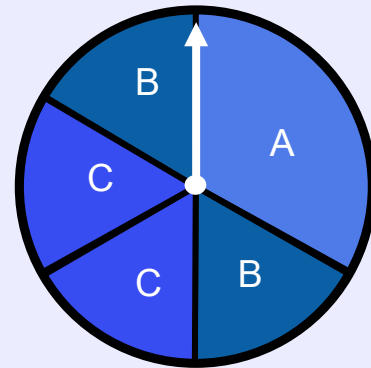
Natiiyooyinka kala duwan ee wareeggan waxay u dhacaan si isku mid ah.



Run



Been



Sabab u sheeg jawaabtaada

a

In kastoo qayb ka weyn tahay kuwa kale, meel isku mid ah ayaa ku taal wareegga (spinner) xaraf kasta.

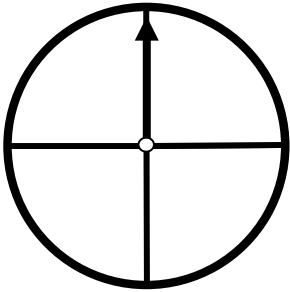


b

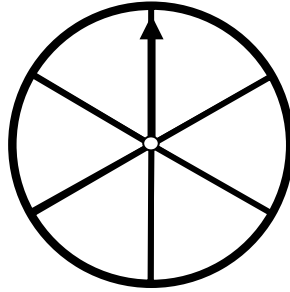
Xarfaha qaarkood way adag tahay in laga helo wareegga (spinner) marka loo eego kuwa kale.

1) Dhammaystir wareegyada (spinners) si natiiyooyinka ay u noqdaan kuwo isku mid ah.

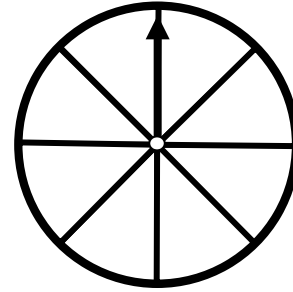
a) $\xi = \{A, B\}$



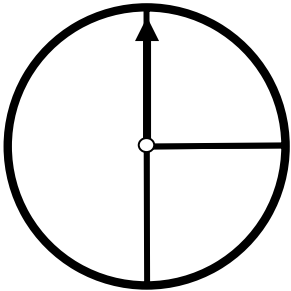
b) $\xi = \{\text{win, lose}\}$



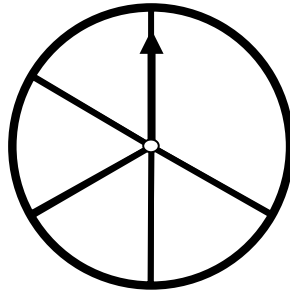
c) $\xi = \{\text{even number, odd number}\}$



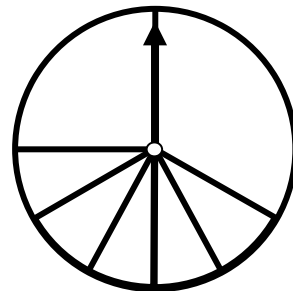
d) $\xi = \{\text{green, blue}\}$



e) $\xi = \{\text{vowel, consonant}\}$



f) $\xi = \{A, B, C\}$



2) Caasha, Nuur iyo Isra waxay ciyaarayaan ciyaar ku lug leh duufaan (dice) 6-dhinac ah oo caadi ah.

Caasha gartiisu way dhaqaaqdaa haddii duufaanku yahay 1 ama 2. Nuur gartiisu way dhaqaaqdaa haddii duufaanku yahay 3 ama 4. Isra gartiisu way dhaqaaqdaa haddii duufaanku yahay 5 ama 6.

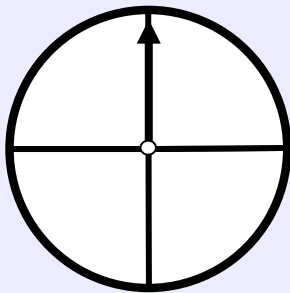
a) Isra waxay u malaynaysaa in 6 uu yahay lambarka ugu adag ee duufaanka laga helo. Sharax sababta tan ay khalad tahay.

b) Meesha muunadda (sample space) waxay muujinaysaa natiijooyinka suurtagalka ah ee tijaabo kasta. $\xi = \{\text{Caasha dhaqaaqday, Nuur dhaqaaqay, Isra dhaqaaqday}\}$

Sharax sababta natiijooyinkan ay isku ehel u yihiin inay dhacaan.

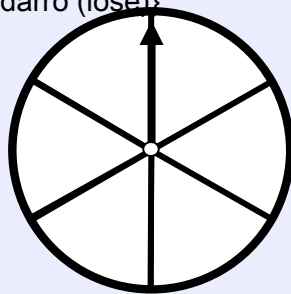
1) Buuxi wareegyada (spinners) si natiijooyinka ay u noqdaan kuwo isku ehel (equally likely).

a) $\xi = \{A, B\}$



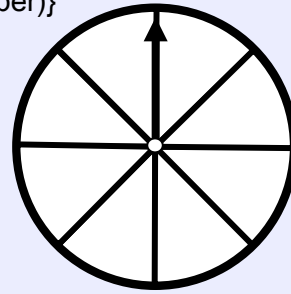
laba qaybood (sectors)
oo A iyo B midkiiba
leeyahay

b) $\xi = \{\text{guul (win),
guuldarro (lose)}\}$



saddex qaybood oo guul iyo
guuldarro midkiiba leeyahay

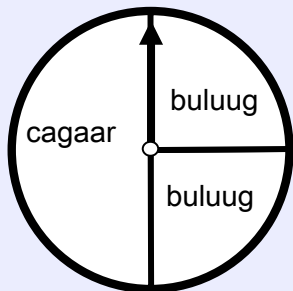
c) $\xi = \{\text{lambar togan (even number), lambar kisi (odd
number)}\}$



laba lambar oo togan (even) iyo laba
lambar oo kisi (odd) ah

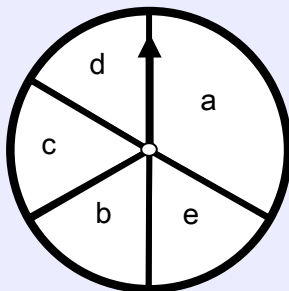
1) Buuxi wareegyada (spinners) si natiijooyinka ay u noqdaan kuwo isku ehel (equally likely).

d) $\xi = \{\text{cagaar, buluug}\}$



midabada waa la
beddeli karaa

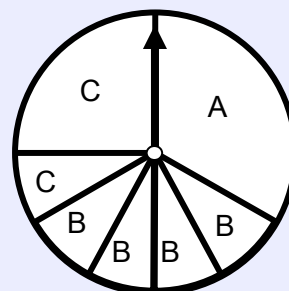
e) $\xi = \{\text{shibbane, shaqal}\}$



xaraf waa la soo celin karaa

Qaybta weyn waxay la mid tahay laba
qaybood oo yaryar.

f) $\xi = \{A, B, C\}$



Qaybta ugu weyn waxay la mid tahay afar
jeer qaybta ugu yar.

Qaybta ku xigta waxay la mid tahay saddex
jeer.

2) Caasha, Nuur iyo Isra waxay ciyaarayaan ciyaar ku lug leh duufaan 6-dhinac ah oo caadi ah.

Caasha gabadheeda ayaa dhaqaaqa haddii duufaanku yahay 1 ama 2. Nuur gabadhiisa ayaa dhaqaaqa haddii duufaanku yahay 3 ama 4. Isra gabadheeda ayaa dhaqaaqa haddii duufaanku yahay 5 ama 6.

a) Isra waxay u malaynaysaa in 6 uu yahay lambarka ugu adag in la duufo. Sharax sababta tan ay khalad tahay.

Lambarka kasta ee duufaanka waa isku mid in la duufo.

b) Meesha muunadda (sample space) si loo muujiyo natiijooyinka suurtagalka ah ee tijaabo kasta. $\xi = \{\text{Caasha dhaqaaqday, Nuur dhaqaaqay, Isra dhaqaaqday}\}$

Sharax sababta natiijooyinkan ay isku mid u yihiin inay dhacaan.

Ciyaaryahan kastaa wuxuu leeyahay tiro isku mid ah oo natiijooyin ah oo dhaqaajiya gabadhiisa, natiijo kastana (lambarka duufaanka) waa isku mid in la duufo.

- Tijaabo waa imtixaan go'an oo keliya.
- Natiijo waa natiijada tijaabo.
- Qaybta natiijooyinka suurtagalka ah ee tijaabo waxaa lagu qori karaa qorista meesha muunadda (sample space).
- **Natiijooyinka waa la qiimeyn karaa si loo go'aamiyo inta ay u dhow yihiin inay dhacaan.**
- Marka la eego suurtagalnimada natiijooyinka, waxaan aqoonsan karnaa marka natiijooyinku ay si isku mid ah u suurtagal yihiin.