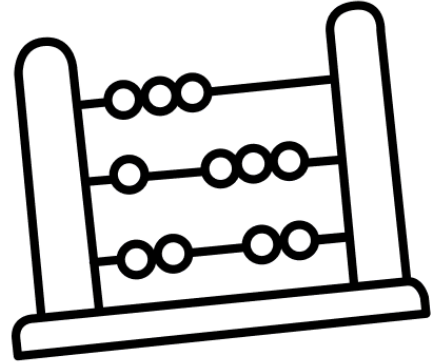


Isbarbardhigga matalaadyo kala duwan si loo xisaabiyo itimaalka (theoretical probabilities)

Maths

Cutub: Itimaal: itimaalka (theoretical probabilities)



Natiijo

Waxaan isbarbardhigi karaa oo aan barbar dhiggi karaa faa'iidada matalaadyada kala duwan marka la xisaabinayo itimaalka (theoretical probabilities).

Erayada muhiimka ah

Soo noqnoqoshada (frequency) waa tirada jeer ee dhacdo (event) dhacdo; ama tirada shakhsiyaadka (dad, xayawaan, iwm) ee leh sifo gaar ah.

Meel muunad (sample space) waa dhammaan natiijooyinka suurtagalka ah ee tijaabo. Jaantuska meesha muunadka waa hab habaysan oo lagu soo saaro meel muunad.

Jaantusyada Venn (Venn diagrams) waa matalaad loo isticmaalo in lagu qaabeeyo su'aalaha tirakoobka/itimaalka. Caadi ahaan goobo ayaa loo isticmaalaa inay matalaan dhacdooyinka.

Itimaalka (theoretical probability) waa itimaal ku salaysan tirinta tirada natiijooyinka la doonayo ee ka yimaada meel muunad halkaas oo dhammaan natiijooyinka shaqsiga ah ay isku ekaan yihiin.

Laan kasta oo ka mid ah geedka itimaalka (probability tree) waxay muujinaysaa natiijo suurtagal ah oo ka timid dhacdo ama heer tijaabo, iyadoo ay weheliso itimaalka dhacdooyinkaas.

Isbarbardhigga matalaadyo kala duwan si loo xisaabiyo itimaalka (theoretical probabilities)



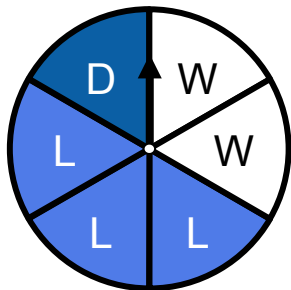
Natiijooyinka iyo itimaallada jaantusyada kala duwan



Muujinta dhacdooyinka jaantusyada kala duwan



Suad waxay wareeggan (spinner) hal mar ku wareejin doontaa.



wareeg (spinner)

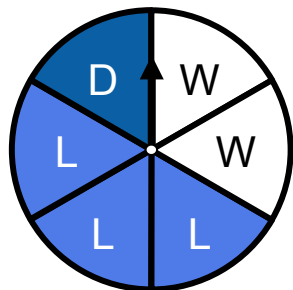
$\xi = \{\text{guul (W),}$
 khasaare (L),
 $\text{sinnaan (D)}\}$

Waxaan u malaynayaa inay suurtagal tahay in la qaato natijjooyinka wareeggan (spinner) oo loo muujiyo itimaalladiisa siyaabo kala duwan, sida...



Suad

Suad waxay wareeggan (spinner) hal mar ku wareejin doontaa.



wareeg (spinner)

$\xi = \{\text{guul (W), khasaare (L), sinnaan (D)}\}$

- W
- W
- L
- L
- L
- D

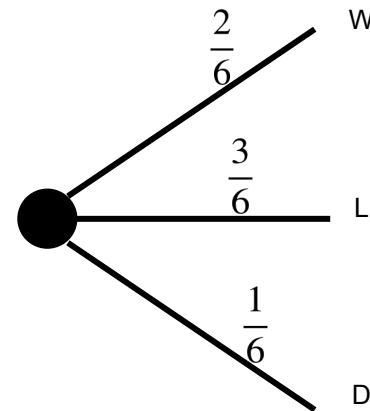
Natijoo kasta oo gaar ah waxay leedahay ixtimaal (probability) dhacdo ah

$$\frac{1}{6}$$

liiska natijoooyinka

natiijo	joogteyn (frequency)	ixtimaal (probability)
guul	2	$P(W) = \frac{2}{6}$
khasaare	3	$P(L) = \frac{3}{6}$
sinnaan	1	$P(D) = \frac{1}{6}$

jaantuska joogteynta (frequency table)



geedka ixtimaalka (probability tree)

W
W
L
L
L
D

Natijjo kasta oo gaar ah waxay leedahay ixtimaal dhacdo. $\frac{1}{6}$

Waxaan la yaabanahay inay suurtagal tahay in la isticmaalo natijjooyinka iyo ixtimaallada (probabilities) hal jaantus si loo dhamaystiro mid kale?

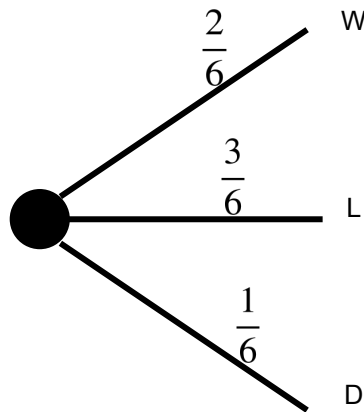
liiska natijjooyinka (outcomes)

natiijo	joogteyn (frequency)	ixtimaal (probability)
guul	2	$P(W) = \frac{2}{6}$
guuldarro	3	$P(L) = \frac{3}{6}$
sawir	1	$P(D) = \frac{1}{6}$

jadwalka soo noqnoqoshada (frequency table)



Suad



geedka ixtimaalka (probability tree)

W
W
L
L
L
D

Natijjo kasta oo gaar ah waxay leedahay itimaal (probability) inay dhacdo. $\frac{1}{6}$

liiska natijoyinka (outcomes)

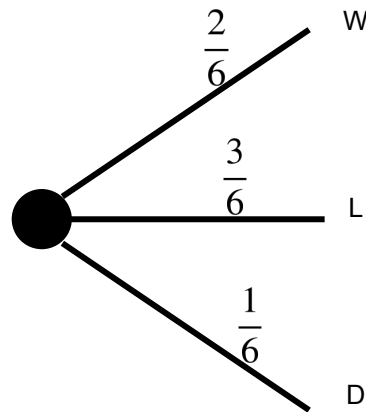
natiijo	soo noqnoqosho	ixtimaal
Guul (win)	2	$P(W) = \frac{2}{6}$
Guul-darro (lose)	3	$P(L) = \frac{3}{6}$
Barbaro (draw)	1	$P(D) = \frac{1}{6}$

jadwalka soo noqnoqoshada (frequency table)

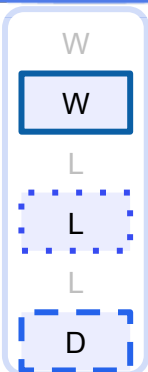
Hubaal!
Maaddaama jaantus kastaa muujinayo isku tijaabo, macluumaadka isku midka ah ayaa lagu arki doonaa dhammaantood!
Tusaale ahaan...



Nuur



geedka ixtimaalka (probability tree)



Natiijo kasta oo gaar ah waxay leedahay itimaal (probability) inay dhacdo.

$$\frac{1}{6}$$

Liiska natijjooyinka (list of outcomes)

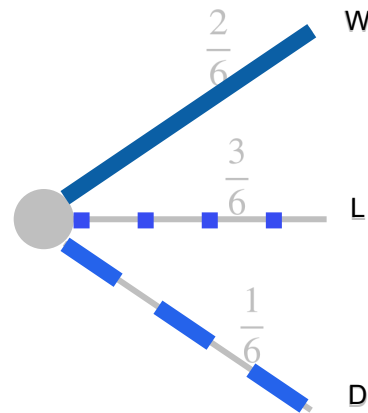
Natiijo (outcome)	Joogteyn (frequency)	Itimaal (probability)
Guul (win)	2	$P(W) = \frac{2}{6}$
Guul-darro (lose)	3	$P(L) = \frac{3}{6}$
Barbaro (draw)	1	$P(D) = \frac{1}{6}$

Jadwalka joogteynta (frequency table)

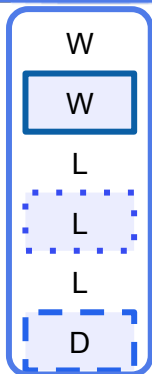
Natiijo kasta oo gaar ah oo ku jirta liiska natijjooyinka waxaa matalaya:

Saf (row) ku jira jadwalka joogteynta (frequency table)

Laan (branch) ku taal geedka itimaalka (probability tree)



Geedka itimaalka (probability tree)



liiska natijoooyinka

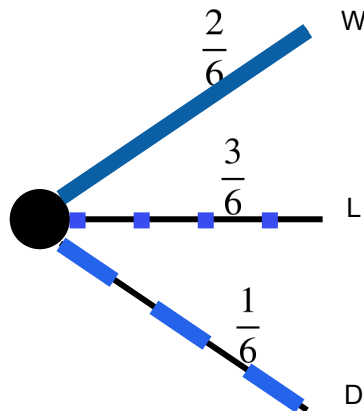
Natijoo kasta waxay leedahay ixtimaal dhacdo.

$$\frac{1}{6}$$

Joogteynta iyo ixtimaalka saddexda waa isku mid, sababtoo ah mid kasta wuxuu muujinayaa natijoooyinka iyo ixtimaalka isku tijaabo.

natiijo	joogteyn (frequency)	ixtimaal (probability)
guul	2	$P(W) = \frac{2}{6}$
lumin	3	$P(L) = \frac{3}{6}$
isku xir (draw)	1	$P(D) = \frac{1}{6}$

shaxda joogteynta (frequency table)



geedka ixtimaalka (probability tree)

Natiijooyinka iyo ixtimaalka jaantusyada kala duwan



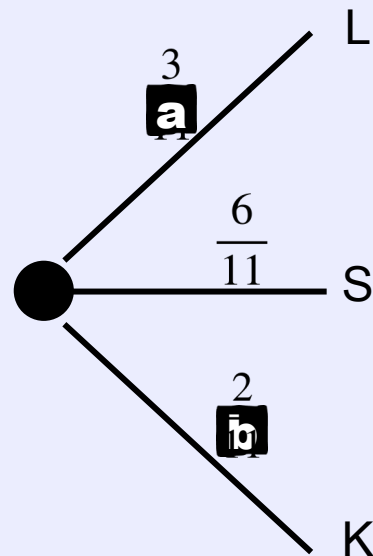
Suad waxay sii wareejin doontaa hal mar.

Waxay bilaabaysaa inay muujiso ixtimaalka in wareejintu ku dhacdo natiijo kasta oo gaar ah iyadoo isticmaalaysa geed iyo shax joogteyn, laakiin labaduba waa qayb.

Waa maxay qiimaha meelaha a, b, c, iyo d?

a, b, c, iyo d waa maxay?

natiijo (outcome)	joogteyn (frequency)	ixtimaal (probability)
liin dhanaan (L)	3	$P(L) = \frac{3}{11}$
strawberry (S)		$P(S) = \frac{6}{11}$
kiwi (K)	2	$P(K) = \frac{2}{11}$



Nuur wuxuu haystaa sanduuq cusub oo ka kooban 11 macmacaan. Sanduuqa waxaa ku jira oo kaliya: toffee (T), fudge (F), iyo earwax (E) macmacaanka.

Nuur wuxuu si kedis ah uga soo xulayaa hal macmacaan sanduuqa. Wuxuu bilaabay inuu sameeyo liiska natiijooyinka suurtagalka ah iyo shax joogteyn (frequency table) si uu u muujiyo ixtimaalka (probability) uu u xusho macmacaan gaar ah. Laakiin labaduba waa qabyo.

Waa kuwee qiimaha lagu dhigi lahaa halka a, b, c, d iyo e ay yihiin?

natiijo	soo noqnoqosho	ixtimaal (probability)
T	b 0	$P(T) = \frac{6}{11}$
F	2	$P(F) = \frac{2}{11}$
E	c 3	$P(E) = \frac{3}{11}$ d
wadarta	a 11	

toffee
fudge
fudge
earwax
toffee
toffee
earwax
toffee
toffee
toffee
e

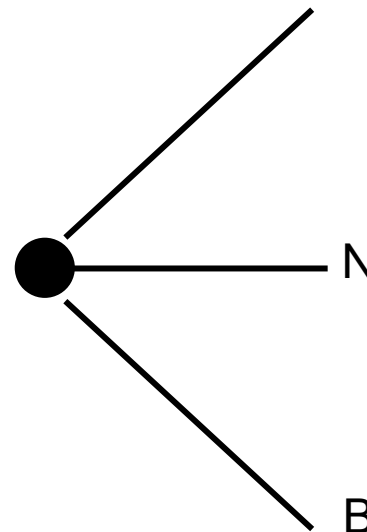
liiska natiijooyinka

horay (F)
horay (F)
horay (F)
dib (B)
dib (B)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)

1) Cali wuxuu sameeyaa liis natiijooyin isku mid ah oo ka yimaada wareeg (spinner).

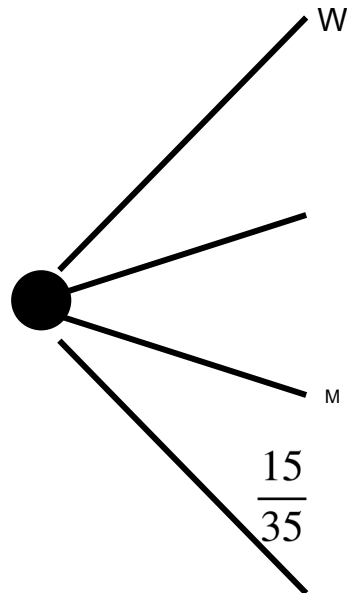
Isticmaal liiskan natiijooyinka si aad u buuxiso jaantuska soo noqnoqosha iyo geedka ixtimaalka.

natiijo	soo noqnoqo sho	ixtimaal (probability)
F		$P() =$
B	2	$P() =$
		$P() =$
wadarta (total)		



2) Shaxda joogista (frequency table) oo dhammaystiran iyo geedka ixtimaalka (probability tree) oo aan dhammaystirneyn labaduba waxay muujinayaan isku tijaabo ah oo ah si aan kala sooc lahayn u doorashada xayawaan gaar ah oo ciyaar ka mid ah. Dhammaystir geedka ixtimaalka (probability tree).

natiijo (outcome)	joogista (freq.)	ixtimaalka (probability)
libaax (lion) (L)	5	$P(L) = \frac{5}{35}$
jiir (mouse) (M)	12	$P(M) = \frac{12}{35}$
nibir (whale) (W)	3	$P(W) = \frac{3}{35}$
qoolley (turtle) (T)	15	$P(T) = \frac{15}{35}$
wadarta (total)	35	

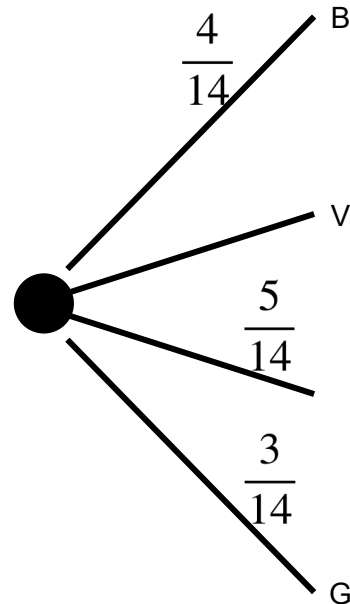


3) Shaxda joogista (frequency table) oo aan dhammaystirneyn iyo geedka ixtimaalka (probability tree) oo aan dhammaystirneyn labaduba waxay muujinayaan isku tijaabo ah oo ah si aan kala sooc lahayn u doorashada koofiyad xafladeed oo midab gaar ah leh.

a) Dhammaystir labada jaantus.

b) Samee liis muujinaya midabka koofiyad kasta oo xafladeed.

natiijo (outcome)	joogista (freq.)	ixtimaalka (probability)
guduud (red) (R)	5	$P(R) = \frac{5}{14}$
buluug (blue) (B)		
	2	$P(V) =$
wadarta (total)		



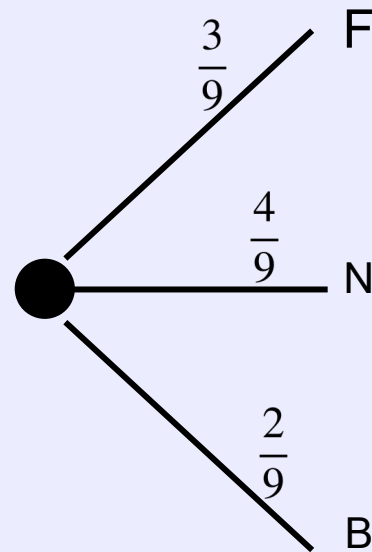
liiska natiijooyinka

horay (F)
horay (F)
horay (F)
dib (B)
dib (B)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)
dhaqaaq la'aan (N)

1) Cali wuxuu sameeyaa liis natiijooyin isku mid ah oo ka yimaada wareeg (spinner).

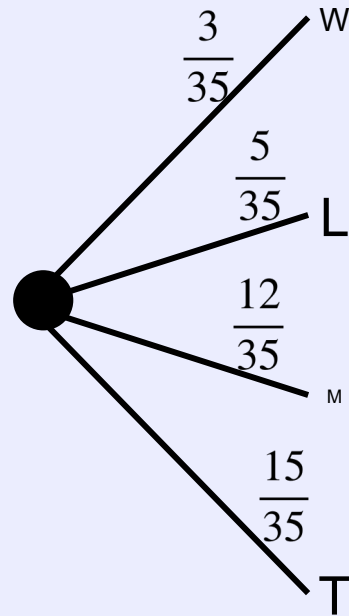
Isticmaal liiskan natiijooyinka si aad u buuxiso shaxda joogtada (frequency table) iyo geedka ixtimaalka (probability tree).

natiijo	joogto (freq.)	ixtimaal
F	3	$P(F) = \frac{3}{9}$
B	2	$P(B) = \frac{2}{9}$
N	4	$P(N) = \frac{4}{9}$
wadarta	9	



2) Labadaba jaantuska (frequency table) oo dhammaystiran iyo geedka itimaalka (probability tree) oo aan dhammaystirnayn waxay muujinayaan isku tijaabo oo ah si aan kala sooc lahayn u doorashada xayawaan gaar ah oo ciyaarta ka mid ah. Dhammaystir geedka itimaalka (probability tree).

natiijo	joogto (freq.)	ixtimaal
libaax (L)	5	$P(L) = \frac{5}{35}$
jiir (M)	12	$P(M) = \frac{12}{35}$
nibir (whale) (W)	3	$P(W) = \frac{3}{35}$
qoolley (turtle) (T)	15	$P(T) = \frac{15}{35}$
wadarta (total)	35	

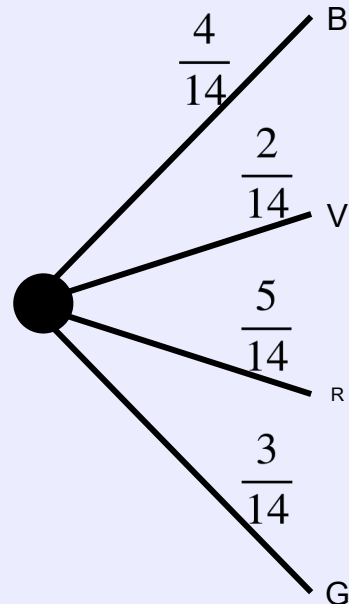


3) Labadaba jaantuska (frequency table) oo aan dhammaystirnayn iyo geedka itimaalka (probability tree) oo aan dhammaystirnayn waxay muujinayaan isku tijaabo oo ah si aan kala sooc lahayn u doorashada koofiyadda xafladda (party hat) midab gaar ah.

a) Dhammaystir labada jaantus.

b) Abuur liis muujinaya midabka koofiyad kasta oo xafladda ah.

natiijo (outcome)	joogteynta (freq.)	itimaalka (probability)
guduud (red) (R)	5	$P(R) = \frac{5}{14}$
cagaar (green) (G)	3	$P(G) = \frac{3}{14}$
buluug (blue) (B)	4	$P(B) = \frac{4}{14}$
violet (V)	2	$P(V) = \frac{2}{14}$
wadarta (total)	14	



liiska natijjooyinka
(list of outcomes)

R	B
R	B
R	B
R	B
R	V
G	V
G	
G	

Qaabka casharka

Isbarbardhigga matalaadyo (representations) badan si loo xisaabiyo
itimaalka (theoretical probabilities)



Natiijooyinka iyo itimaalka (probabilities) ee jaantusyada kala duwan



Muujiinta dhacdooyinka (events) ee jaantusyada kala duwan

Wareeggu wuxuu leeyahay natiijooyinkan:

$$\xi = \{1, 1, 2, 3, 3, 4, 4, 4, 4, 5, 5, 5, 6, 7, 7\}$$

Tijaabo: wareeggan hal mar.

Dhacdo: wareeggu wuxuu ku degayaa lambar asaasi ah.

Haddii aad kaliya danaynayso
lambarrada asaasiga ah, waxaad
isticmaali kartaa laba laamood,
sax?
Mid natiijooyinka asaasiga ah,
midna kuwa aan asaasiga ahayn?



Nuur

Waa, miyaan runtii u baahanahay inaan
sawiro geed ixtimaal (probability tree) oo
leh toddoba laamood iyo miis leh
toddoba saf si aan u helo ixtimaalka ku
degista lambar asaasi ah?!



Suad

Wareeggu wuxuu leeyahay natiijooyinkan:

$S = \{1, 1, 2, 3, 3, 4, 4, 4, 4, 5, 5, 5, 6, 7, 7\}$

Tijaabo: wareeggan hal mar.

Dhacdo: wareeggu wuxuu ku degayaa lambar asaasi ah.

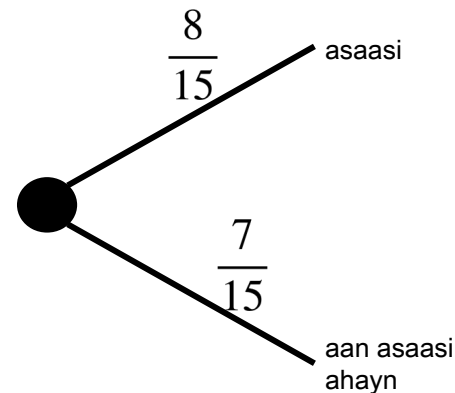
Waxaan ku muujin karnaa dhacdadan miis natiijooyin ah si aan u dhisno geed ixtimaal (probability tree).

asaasi	aan asaasi ahayn
2	1 1
3 3	4 4 4 4
5 5 5	6
7 7	

Waxaa jira wadar ahaan 15 natiijo.

$$P(\text{prime}) = \frac{8}{15}$$

$$P(\text{not prime}) = \frac{7}{15}$$



Muujiinta dhacdooyinka jaantusyo kala duwan

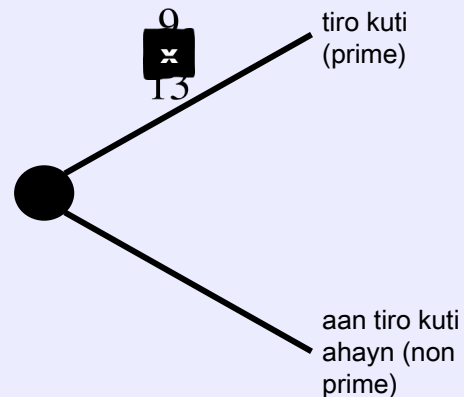


Hubi

Jaantusyada labaduba waxay muujinayaan tijaabinta kaad (card) random ah oo laga soo qaaday xirmo kaad (deck) xisaab ah.

Waa maxay itimaalka (probability) ku yaal laanta (branch) loo calaamadeeyay x?

tiro kuti (prime)	aan tiro kuti ahayn (not prime)
2	1
2	4
2	6
2	9
3	
3	
5	
7	
7	



Kaad (card) dheeri ah ayaa lagu daray xirmada (deck).

Mid ka mid ah weedhahan ayaa sax ah?

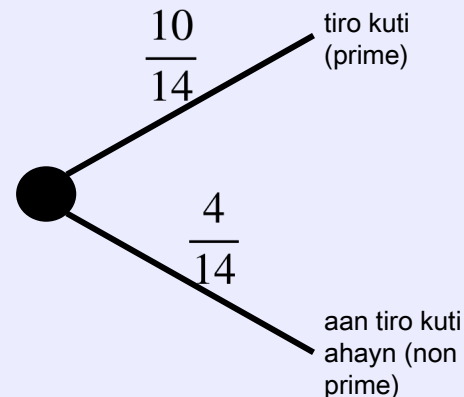
✓ **a** Tirada natiijooyinka tiro kuti (prime outcomes) ayaa isbeddelay.

b Tirada natiijooyinka aan tiro kuti ahayn (non-prime outcomes) ayaa isbeddelay.

✓ **c** Itimaalka (probability) qaadista tiro kuti (prime) ayaa isbeddelay.

✓ **d** Itimaalka (probability) qaadista aan tiro kuti ahayn (non-prime) ayaa isbeddelay.

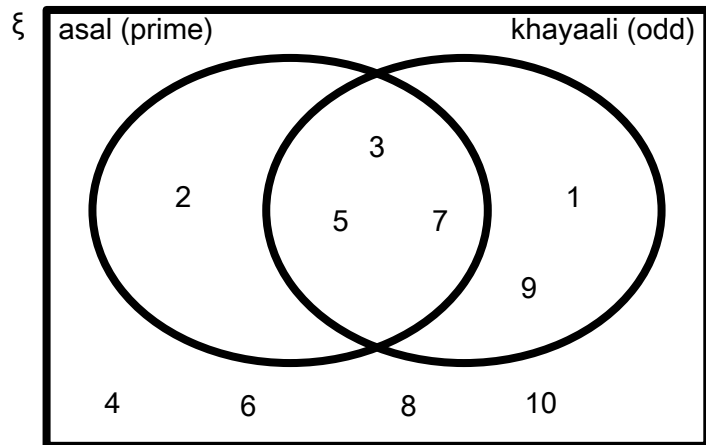
tiro kuti (prime)	aan tiro kuti ahayn (not prime)
2	1
2	4
2	6
3	9
3	
3	
5	
7	
7	



Laydh (dice) 10-dhinac leh wuxuu leeyahay tirooyin (integers) 1 ilaa 10 oo ku qoran dhinacyadiisa.

Tijaabo: Lagu duugo hal mar.

Dhacdo: wareeggu wuxuu ku degayaa tiro asal ah (prime number).



Jaantuska Venn oo muujinaya natiijooyinka shaqsiga ah

Waan jahwareersanahay.

Jaantuskan Venn wuxuu muujinayaa laba dhacdo (event): tiro kuti (primes) iyo tirooyin kisi (odd numbers).

Sideen diirada u saari karaa kaliya natiijooyinka tiro kuti (prime) ah?

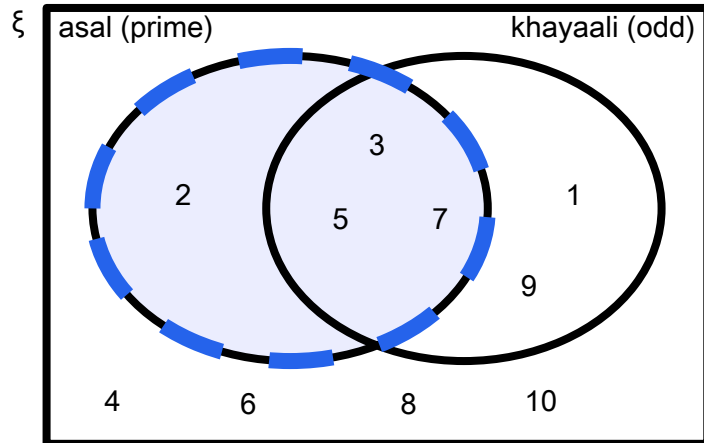


Suad

Laba-geesood 10-cirif ah wuxuu leeyahay tirooyinka 1 ilaa 10 oo ku qoran wejigiisa.

Tijaabo: Lagu duugo hal mar.

Dhacdo: wareegu wuxuu ku degayaa tiro asal ah (prime number).



Jaantuska Venn oo muujinaya natiijooyinka shaqsiga ah

Dhammaan natiijooyinka ku jira goobada bidix waa tirooyin asal ah (prime numbers).

Tan waxaa ku jira dhexda (isgoysyada).

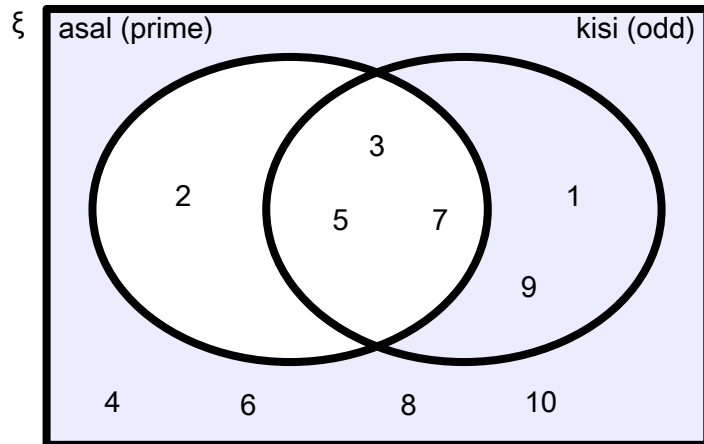
Waxaa jira afar tiro asal ah (prime numbers) oo ku yaal lafaha.

$$P(\text{prime}) = \frac{4}{10}$$

Laba-geesood 10-cirif ah wuxuu leeyahay tirooyinka 1 ilaa 10 oo ku qoran wejigiisa.

Tijaabo: Lagu duugo hal mar.

Dhacdo: wareeggu wuxuu ku degayaa tiro asal ah (prime number).



Jaantuska Venn oo muujinaya natiijooyinka shaqsiga ah

Dhammaan tirooyinka kale ee ka baxsan goobtan waa natiijooyin aan ahayn tiro-mur (prime).

Waxaa jira lix tiro oo aan tiro-mur ahayn oo ku yaal dice-ga.

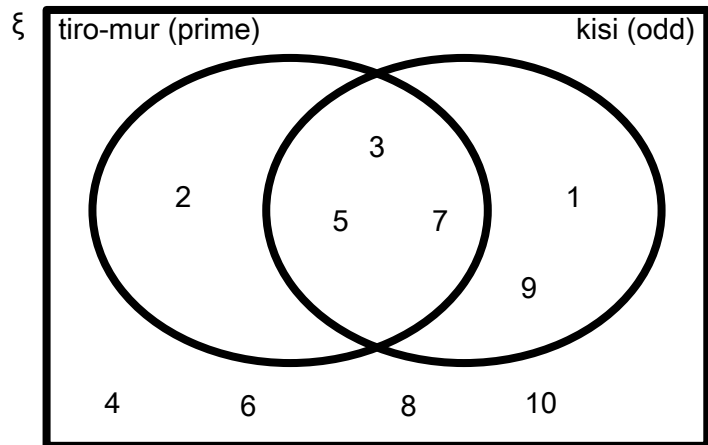
$$P(\text{tiro-mur}) = \frac{4}{10}$$

$$P(\text{aan tiro-mur ahayn}) = \frac{6}{10}$$

Dice 10-dhinac leh ayaa wajaheeda ku qoran tirooyin (integers) laga bilaabo 1 ilaa 10.

Tijaabo (Trial): Dice-ga hal mar rogid.

Dhacdo (Event): Spinner-ku wuxuu ku dhacaa tiro-mur (prime number).

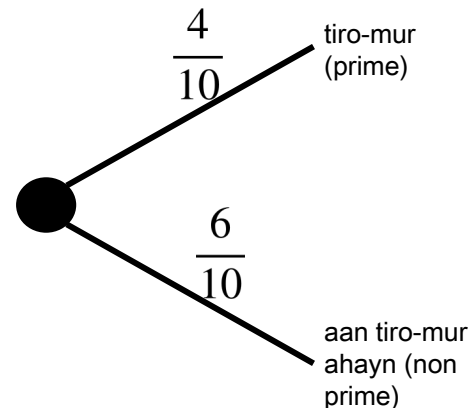


Jaantuska Venn oo muujinaya natiijooyinka shaqsiga ah

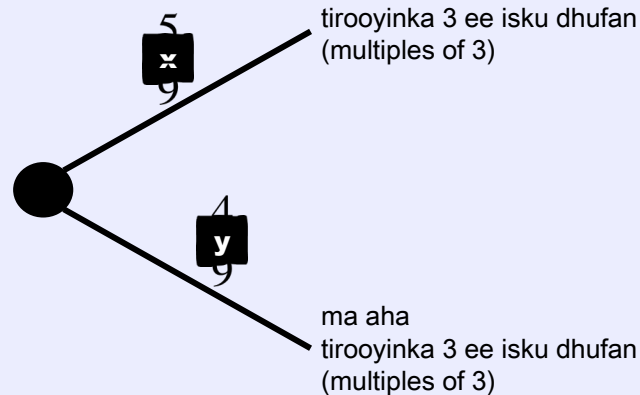
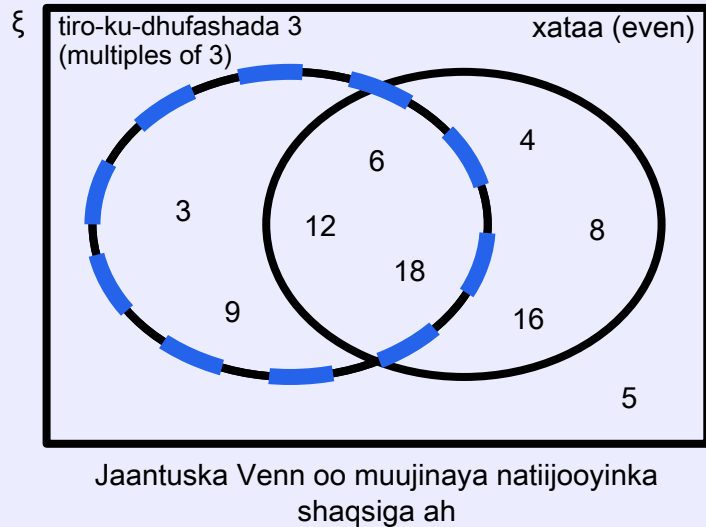
Natiijooyinka dhacdadan waxaa lagu muujin karaa geed itimaal (probability tree).

$$P(\text{tiro-mur}) = \frac{4}{10}$$

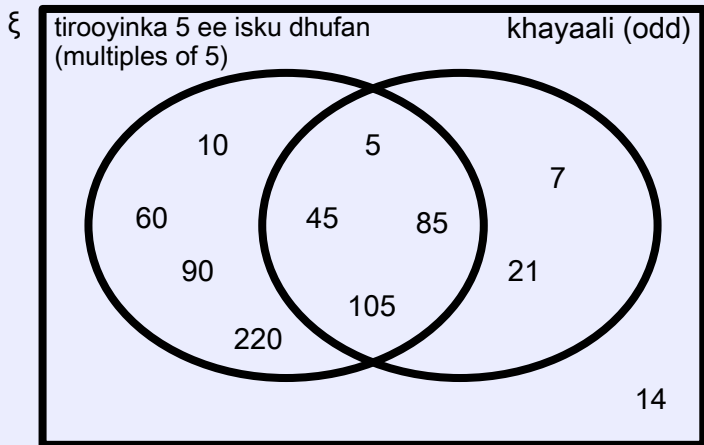
$$P(\text{aan tiro-mur ahayn}) = \frac{6}{10}$$



Waa maxay itimaalka (probabilities) ee ku yaal laamaha lagu calaamadeeyay x iyo y?

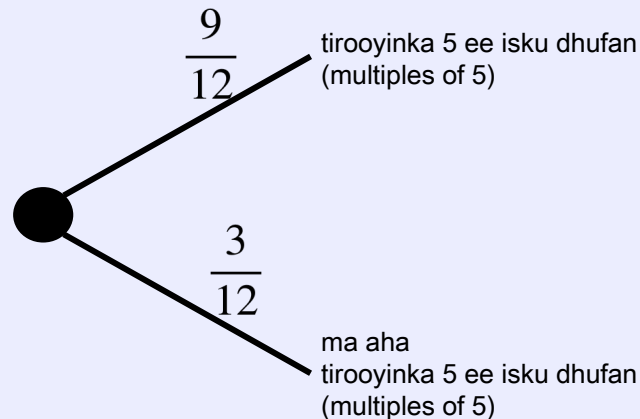


Geedka itimaalka (probability tree) si sax ah ayaa loo calaamadeeyay.
Jaantuska Venn (Venn diagram) wuxuu ka maqan yahay hal natiijo.
Soo jeedi hal natiijo oo suurtoagal ah oo lagu dari karo jaantuska Venn si uu u noqdo mid sax ah.



Jaantuska Venn (Venn diagram) oo muujinaya natiijooyinka shaqsiga ah

Wax kasta oo ka mid ah tirooyinka 5 ee isku dhufan (multiples of 5).



Wareeg (spinner) 11-geesood ah ayaa leh tirooyinka 0 ilaa 10 oo ku qoran wejiyadiisa.

Tijaabo (Trial): Wareegga hal mar la wareejiyo.

Dhacdo (Event): wareeggu wuxuu ku degayaa tiro laba jibaaran (square number).

laba jibaaran (square)	aan laba jibaaranayn
0	2
1	3
4	5
9	6
	7
	8
	10

Waxaan rabaa inaan sidoo kale muujiyo natiijooyinkan jaantuska Venn (Venn diagram)...

Laakiin run ahaantii ma doonayo inaan qoro dhammaan tirooyinka mar kale!

Mar walba waxaan sawiraa jaantuskeyga Venn (Venn diagram) oo aad u yar!



Suad

Wareejiye 11-dhinac leh ayaa tirooyinka 0 ilaa 10 ku qoran wejigiisa.

Tijaabo (Trial): Wareejinta wareejiyaha hal mar.

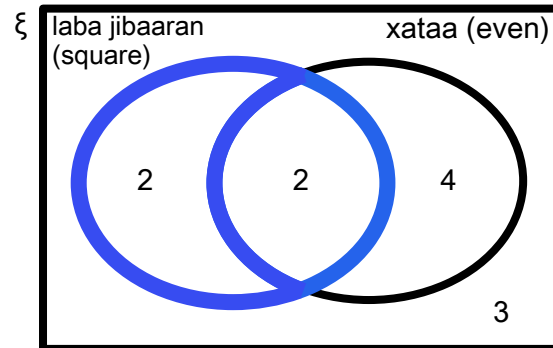
Dhacdo (Event): wareejiyuhu wuxuu ku soo degayaa tiro laba jibaaran (square number).

Waxaa jira nooc labaad oo Jaantuska Venn ah; kaas oo muujinaya tirada natiijooyinka dhacdo kasta, halkii laga muujin lahaa natiijooyinka laftooda.

laba jibaaran (square)	aan laba jibaaranayn
0	2
1	3
4	5
9	6
	7
	8
	10

Waxaa jira laba tiro oo laba jibaaran oo xataa ah...

iyo laba tiro oo laba jibaaran oo qariib ah.



Jaantuska Venn oo muujinaya tirada natiijooyinka

Wareegiyaha 11-geesoodka ah wuxuu leeyahay tirooyinka 0 ilaa 10 oo ku qoran wejigiisa.

Tijaabo: Wareejinta wareegiyaha hal mar.

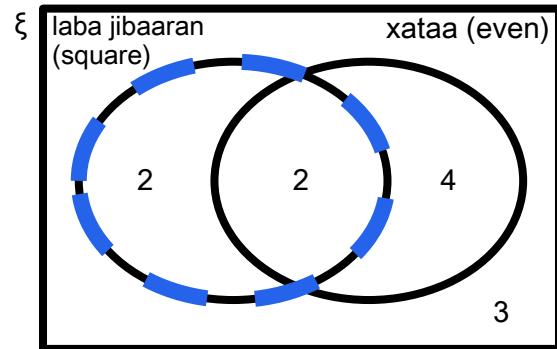
Dhacdo: wareegiyuhu wuxuu ku degayaa tiro laba jibaaran (square number).

Waxaa jira nooc labaad oo jaantuska Venn; kaas oo muujinaya tirada natiijooyinka dhacdo kasta, halkii laga muujin lahaa natiijooyinka gaarka ah.

laba jibaaran (square)	aan laba jibaaranayn
0	2
1	3
4	5
9	6
	7
	8
	10

Waxaa jira afar tiro oo laba jibaaran oo ku jira shaxda natiijooyinka.

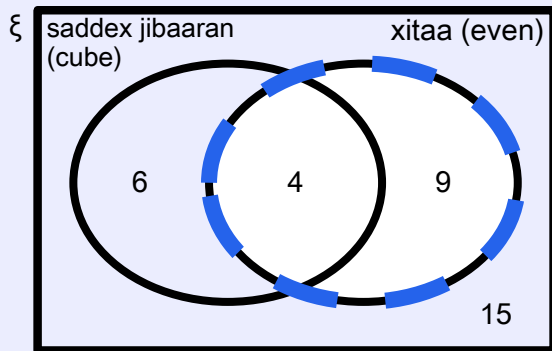
$2 + 2 = 4$ wadar ahaan natiijooyinka goobtan.



Jaantuska Venn oo muujinaya tirada natiijooyinka

Jaantuskan Venn iyo shaxda natiijooyinka labaduba waxay muujinayaan dhacdooyin isku mid ah.

Imisa natiijooyin ayay tahay inay ku jiraan qayb kasta oo ka mid ah shaxda natiijooyinka?



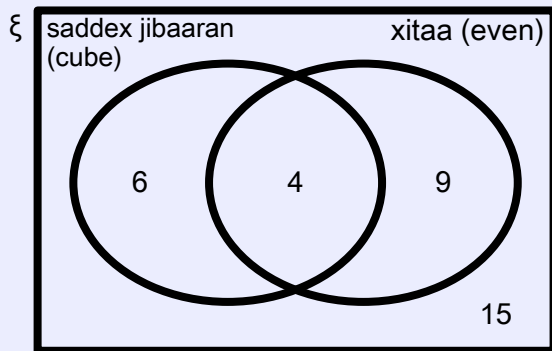
Jaantuska Venn oo muujinaya tirada natiijooyinka

xitaa (even)	khariij (odd)
$4 + 9 = 13$ natiijo	$6 + 15 = 21$ natiijo

Jaantuskan Venn iyo shaxda natiijooyinka labaduba waxay muujinayaan dhacdooyin isku mid ah.

Find P(odd).

$$\frac{21}{34}$$



Jaantuska Venn oo muujinaya tirada natiijooyinka

xitaa (even)	khariij (odd)
13 outcomes	21 outcomes

1) Jaantuskan Venn iyo shaxda natiijadu waxay muujinayaan dhacdooyin isku mid ah.

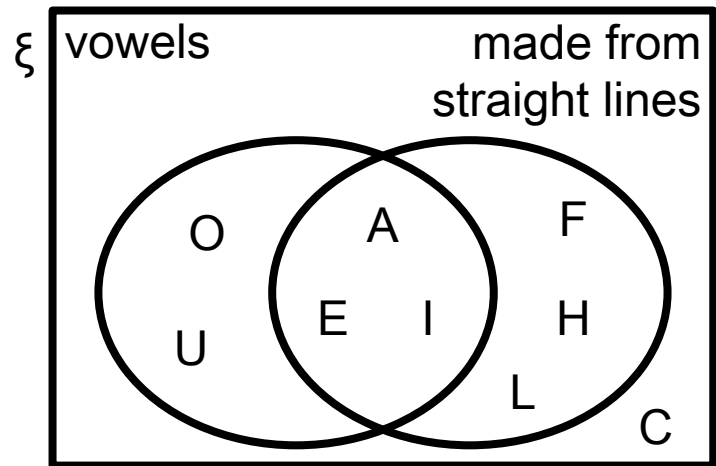
a) Isticmaal jaantuska Venn si aad u buuxiso shaxda natiijada.

Find these probabilities:

b) $P(\text{vowel})$

c) $P(\text{not vowel})$

d) $P(\text{made from straight lines})$



Venn diagram showing individual outcomes

vowels	not vowels

2) A spinner has outcomes:

$$\xi = \{1, 1, 1, 2, 2, 3, 4, 4, 5, 5, 5, 6, 7, 7, 7, 8, 9\}$$

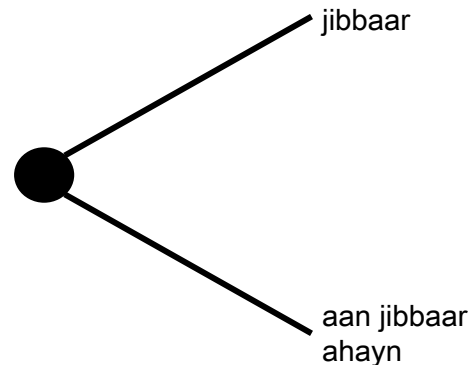
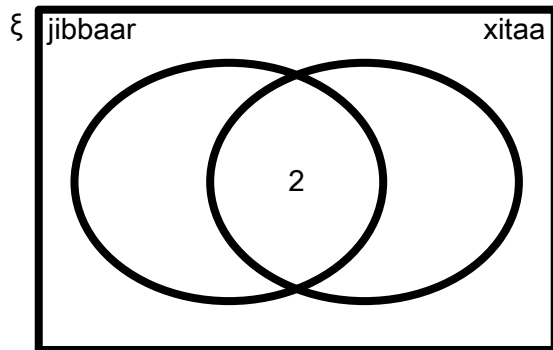
Tijaabo: wareejinta wareegga hal mar

Dhacdo: ku degista tiro labajibbaaran (square number)

a) Buuxi shaxda natiijada, jaantuska Venn (muujinaya tirada natiijooyinka), iyo geedka ixtimaalka (probability tree) ee dhacdadan.

b) Circle or highlight the outcomes or branches in each diagram that are required to calculate the probability of $P(\text{not square})$.

square	not square

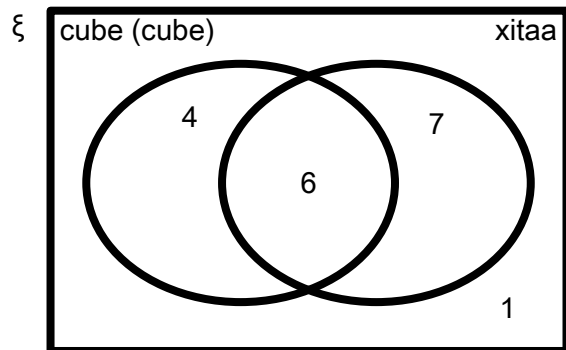


3) Jaantuska Venn (muujinaya tirada natiijooyinka), shaxda natiijooyinka, iyo geedka ixtimaalka (probability tree) dhamaantood waxay muujinayaan isla dhacdada tijaabada.

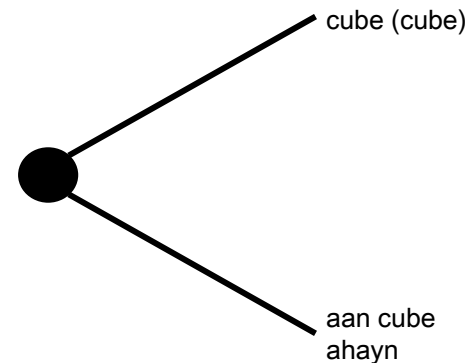
a) Shaxda natiijooyinka waxaa ka maqan qaar ka mid ah natiijooyinka!

Isticmaal jaantuska Venn ee saxda ah si aad u soo jeediso natiijooyin suurtagal ah oo loogu talagalay shaxda.

b) Dhammeystir geedka ixtimaalka.



cube (cube)			aan cube ahayn		
64	0	8	2	2	2
8	1	27	4	10	
27		64	20		36



1) Jaantuskan Venn iyo shaxda natiijooyinka waxay muujinayaan isla dhacdooyinka.

a) Isticmaal jaantuska Venn si aad u dhammeystirto shaxda natiijooyinka.

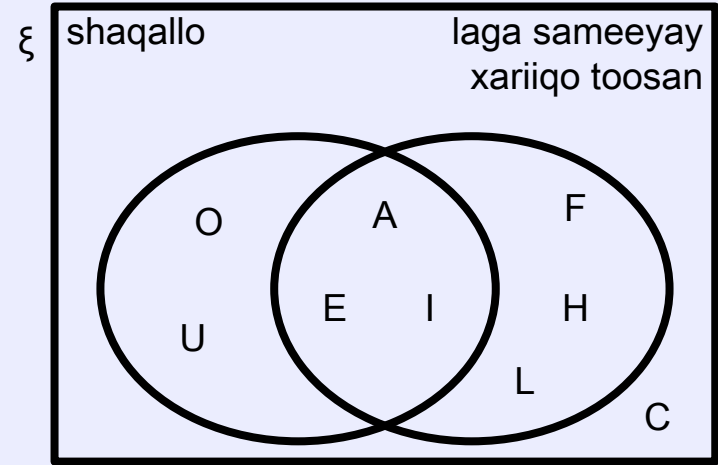
Soo hel ixtimaalladan:

b) $P(\text{shaqal}) = \frac{5}{9}$

c) $P(\text{aan shaqal ahayn}) = \frac{4}{9}$

d) $P(\text{laga sameeyay xariiqo toosan}) =$

$\frac{6}{9}$



Jaantuska Venn oo muujinaya natiijooyin gaar ah

shaqallo	aan shaqallo ahayn
O U A E I	L H F C

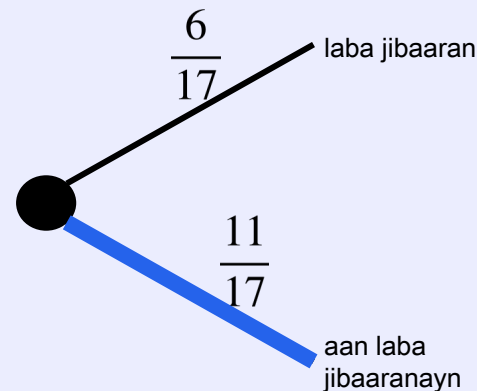
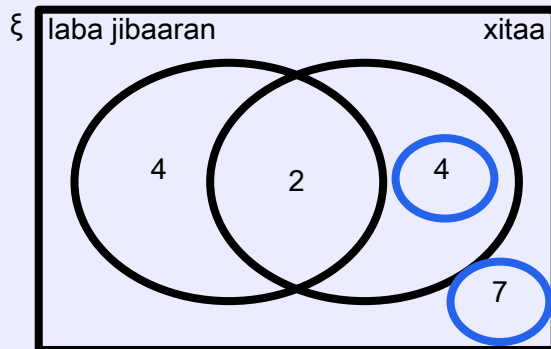
2) Wareeggu wuxuu leeyahay natiijooyin:

$$\xi = \{1, 1, 1, 2, 2, 3, 4, 4, 5, 5, 5, 6, 7, 7, 7, 8, 9\}$$

Tijaabo: wareegga hal mar Dhacdo: ku degtaa tiro laba jibaaran

- a) Buuxi jaantuska natiijooyinka, jaantuska Venn (muujinaya tirada natiijooyinka), iyo geedka ixtimaalka ee dhacdadan.
- b) Goobo ama calaamadee natiijooyinka ama laamaha jaantus kasta oo loo baahan yahay si loo xisaabiyo ixtimaalka P(aan laba jibaaranayn).

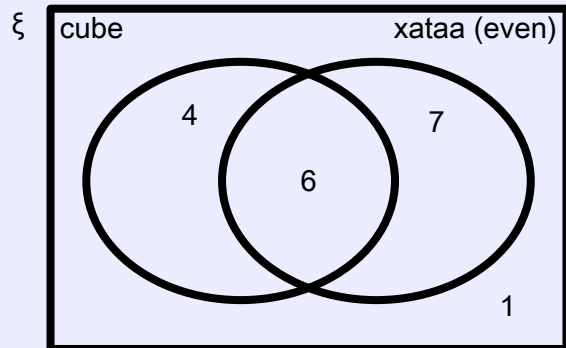
laba jibaaran			aan laba jibaaranayn		
1	1	1	2	2	3
4	4		5	5	5
			6	7	7
9			7	8	



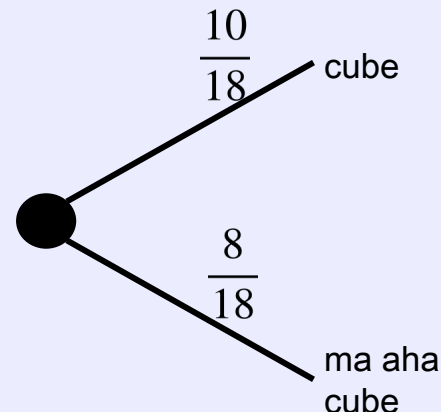
3) Jaantuska Venn (muujinaya tirada natiijooyinka), jaantuska natiijooyinka, iyo geedka ixtimaalka waxay muujinayaan isla dhacdo ka timid tijaabo.

a) Jaantuska natiijooyinka wuxuu ka maqan yahay qaar ka mid ah natiijooyinkiisa!
Isticmaal jaantuska Venn ee saxda ah si aad u soo jeediso natiijooyin suurtagal ah oo loogu talagalay jaantuska.

Hal lambar cube xataa (tusaale 8), hal lambar cube khafiif (tusaale 27), iyo hal lambar khafiif oo aan ahayn cube (tusaale 5) waa in lagu daro
b) Buuxi geedka ixtimaalka.



cube			ma aha cube		
64	0	8	2	2	2
8	1	27	4	10	
27		64	20		36



Soo koobid

Natiijooyinka iyo ixtimaalka tijaabo hal-mar (one-stage trial) waxaa lagu muujin karaa siyaabo kala duwan, oo ay ku jiraan jaantusyo soo noqnoqon (frequency tables) iyo geedo ixtimaal (probability trees).

Ixtimaalka dhacdo keliya waxaa lagu muujin karaa siyaabo kala duwan, oo ay ku jiraan jaantusyo natiijo, geedo ixtimaal, iyo noocyo kala duwan oo Venn diagram ah.