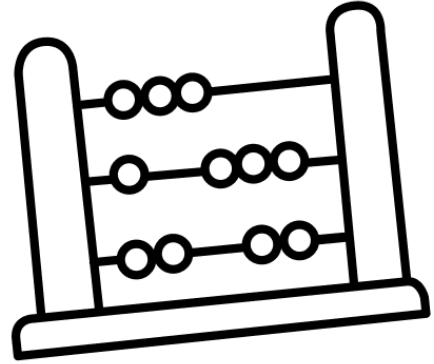


Xisaabinta ixtimaalka (theoretical probabilities) ee shaxanka laba- geesoodka ah (laba dhacdo)

Maths

Cutub: Ixtimaalka: ixtimaalka (theoretical probabilities)



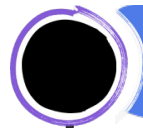
Natiijo

Waxaan xisaabin karaa oo isticmaali karaa ixtimaalka (theoretical probabilities) ee dhacdooyinka isku-dhafan iyadoo la isticmaalayo shaxanka laba-geesoodka ah (2 dhacdo).

Erayada muhiimka ah

Ixtimaalka (theoretical probability) waa ixtimaal ku salaysan tirinta tirada natiijooyinka la doonayo ee meel muunad ah halkaas oo dhammaan natiijooyinka shaqsigu ay isku ekaansho yihiin.

Xisaabinta ixtimaalka (theoretical probabilities) ee shaxanka laba-geesoodka ah (laba dhacdo)



Ixtimaalka (theoretical probabilities)

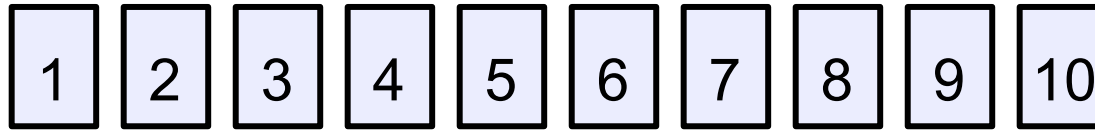


Ixtimaalka dhacdooyinka isku-dhafan

Ixtimaalka (theoretical probabilities)

Xirmo kaarar ah waxaa ku jira tirooyinka 1 ilaa 10.

Kaararka waxaa loo kala saari karaa tirooyin khariijin (odd) iyo tirooyin siman (even) iyadoo la isticmaalayo shax.



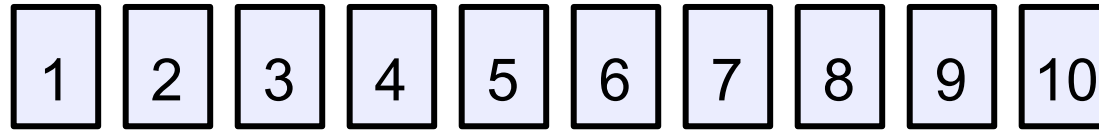
khariijin (odd)	siman (even)
135 79	246 810

Ixtimaalka (theoretical probabilities)



Sharaxaad

Kaararka waxaa sidoo kale loo kala saari karaa tirooyin jibbaar (square numbers) iyo kuwa aan jibbaar ahayn iyadoo la isticmaalayo shax.

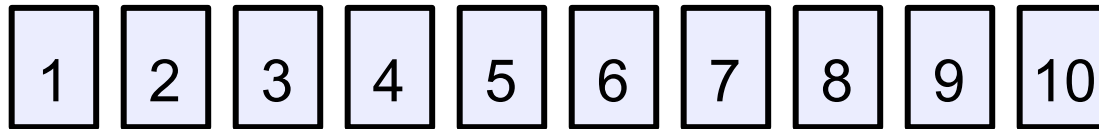


khariijin (odd)	siman (even)
1 3 5 7 9	2 4 6 8 10

jibbaar (square)	aan jibbaar ahayn (not square)
1 4 9	2 3 5 6 7 8 10

Ixtimaalka (theoretical probabilities)

Labada shax waa la isku dari karaa.

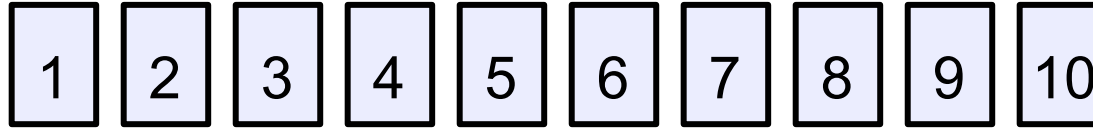


kisi (odd)	xataa (even)
1 3 5 7 9	2 4 6 8 10

jibbaar (square)	aan jibbaar ahayn (not square)
1 4 9	2 3 5 6 7 8 10

Ixtimaalka aragtida (Theoretical probabilities)

Labada shax waa la isku dari karaa.



	jibbaaran (square)	aan jibbaaranayn (not square)
kisi (odd)	19	357
xataa (even)	4	26810

Kaar baa laga soo doortay xirmada si aan kala sooc lahayn.

$$P(\text{kisi}) = \frac{5}{10}$$

$$P(\text{jibbaaran}) = \frac{3}{10}$$

$$P(\text{kisi iyo jibbaaran}) = \frac{2}{10}$$

Cabitaannadan waxaa loo kala saaray shaxda natiijada (outcome table) iyadoo loo eegayo haddii ay leeyihiin gacan ama baloog.



	gacan (handle)	gacan la'aan (no handle)
baloog (straw)	B C F I	D E H
baloog la'aan (no straw)	A	G

Cabitaan baa la soo doortay si aan kala sooc lahayn.

P(gacan la'aan iyo baloog) =

$$\frac{3}{9}$$

P(gacan iyo baloog la'aan) =

$$\frac{1}{9}$$

P(gacan iyo shabaq) =

$$\frac{4}{9}$$

Suurtogalnimada aragtida (Theoretical probabilities)

Wareegga waa la wareejiyay hal mar.

Waa maxay suurto galnimada inuu ku soo degto lambar khudmo ah iyo qaybiyaha 10?



	qaybiyaha 10	aan qaybiyaha 10 ahayn
xitaa (even)	2	4
khudmo (odd)	5 1	3

$P(\text{khudmo iyo qaybiyaha } 10) =$

$$\frac{2}{5}$$

Suurtogalnimada aragtida (Theoretical probabilities)

Wareegga waa la wareejiyay hal mar.

Waa maxay suurto galnimada inuu ku soo degto lambar xitaa ah oo aan qaybiyaha 10 ahayn?



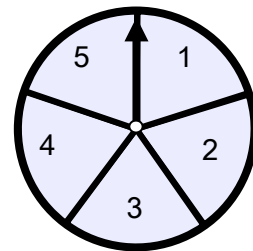
	qaybiyaha 10	aan qaybiyaha 10 ahayn
xitaa (even)	2	4
khudmo (odd)	5 1	3

$P(\text{xitaa iyo aan qaybiyaha 10 ahayn}) =$

$$\frac{1}{5}$$

Ciyaar baa la ciyaarayaa halkaas oo ciyaartoydu ku wareejiyaan wareegga laba jeer oo ay helaan wadarta lambarradooda.

Shaxda natijada waxay tusinaysaa wadarta suurtoogalka ah.



		wareeg 1				
		1	2	3	4	5
wareeg 2	1	2	3	4	5	6
	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10

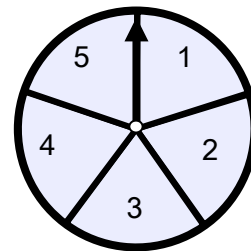
$A = \{\text{xitaa (even)}\}$

$B = \{\text{in ka badan 5}\}$

$P(A \text{ iyo } B) = \{\text{xataa (even) iyo in ka badan 5}\}$

$$= \frac{9}{25}$$

Waxaan u isticmaali karnaa jaantuska natiijada si aan u abuurno jaantus laba-geesood ah labada dhacdo $A = \{\text{xataa (even)}\}$ iyo $B = \{\text{in ka badan 5}\}$.



Marka aan gelinno inta jeer ee dhacdo (frequencies), waxaan si hufan u heli karnaa ixtimaalka dhacdooyinka A iyo B.

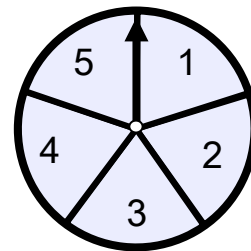
		wareeg 1				
		1	2	3	4	5
wareeg 2	1	2	3	4	5	6
	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10

	B	ma aha B	wadarta
A	9	4	13
ma aha A	6	6	12
wadarta	15	10	25

Waa la ciyaarayaa ciyaar halkaas oo ciyaartoydu ku wareejiyaan wareejiyaha (spinner) laba jeer oo ay helaan wadarta tirooyinkooda.

$A = \{\text{xataa (even)}\}$

$B = \{\text{in ka badan 5}\}$



	B	ma aha B	wadarta
A	9	4	13
ma aha A	6	6	12
wadarta	15	10	25

Waa maxay ixtimaalka in wadartu aysan ahayn xataa (even) oo ay ka badantahay 5?

$$\frac{6}{25}$$

Waa maxay ixtimaalka in wadartu aysan ahayn xataa (even) oo aysan ka badnayn 5?

$$\frac{6}{25}$$

Qaar ka mid ah koofiyadaha xafladaha ayaa lagu kala saaray shaxda natijada (outcome table) iyadoo lagu salaynayo laba dhacdo, haddii ay xariijimo leeyihiin iyo haddii ay dusha sare leeyihiin.



Haddii koofiyad xaflad si random ah loo doorto, waa maxay itimaalka (probability) in aanay xariijimo lahayn oo ay dusha sare leedahay?

	xariijimo leh	xariijimo la'aan	wadarta
dusha sare leh	4	5	9
dusha sare la'aan	2	2	4
wadarta	6	7	13

$$\frac{5}{13}$$

Qaar ka mid ah koofiyadaha xafladaha ayaa lagu kala saaray shaxda natijada (outcome table) iyadoo lagu salaynayo laba dhacdo, haddii ay xariijimo leeyihiin iyo haddii ay dusha sare leeyihiin.



Haddii koofiyad xaflad si random ah loo doorto, waa maxay itimaalka (probability) in ay xariijimo leedahay oo ay dusha sare leedahay?

	xariijimo leh	xariijimo la'aan	wadarta
dusha sare leh	4	5	9
dusha sare la'aan	2	2	4
wadarta	6	7	13

$$\frac{4}{13}$$

1) Wareeggan (spinner) ayaa hal mar la wareejin doonaa.

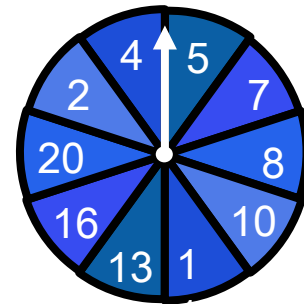
a) Buuxi shaxda natijada (outcome table) labada dhacdo: ka yar 12 iyo tiro asal ah (prime).

	ka yar 12	aan ka yarayn 12
tiro koowaad (prime)		
aan ahayn tiro koowaad		

b) Raadi $P(\text{ka yar 12 iyo tiro koowaad})$

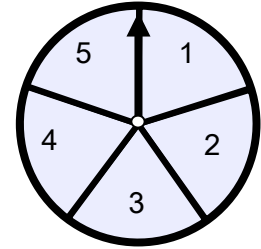
c) Raadi $P(\text{aan ahayn tiro koowaad iyo aan ka yarayn 12})$

d) Raadi $P(\text{tiro koowaad iyo aan ka yarayn 12})$



2) Wareegtan (spinner) waxaa la wareegi doonaa laba jeer ka dibna wax soo saarka (product) labada lambar waa la helaa.

a) Buuxi shaxda natiijada si aad u muujiso wax soo saarka suurtagalka ah.



wareeg 1		1	2	3	4	5
wareeg 2	1					
	2					
	3					
	4					
	5					

b) Raadi $P(\text{iskaaran (square) iyo qayb ka mid ah } 36)$

c) Raadi $P(\text{xitaa (even) iyo ka yar } 18)$

3) Shaxdan laba-geesoodka ah waxay muujinaysaa inta jeer ee kubbadaha ciyaaraha qaarkood loo kala saaray qaabkooda iyo inay leeyihiin tolmo dusha korkooda iyo in kale.

tusaale: kubbadda cagta Maraykanka ma aha wareegsan laakiin waxay leedahay tolmo, halka kubbadda golf-ku ay tahay wareegsan laakiin aan lahayn



	wareegsan	aan wareegsanayn	wadarta
tolmo	4	1	5
aan tolmo lahayn	11	2	13
wadarta	15	3	18

Kubad si random ah ayaa loo xushay.

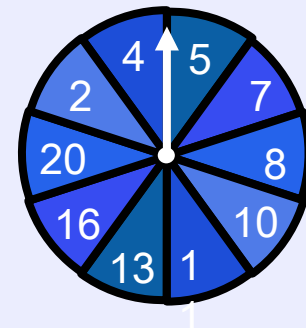
a) Raadi $P(\text{wareegsan (spherical) iyo leh tolmo (stitching)})$

b) Raadi $P(\text{wareegsan iyo aan lahayn tolmo})$

1) Wareegtan (spinner) hal mar ayaa la wareejiin doonaa.

a) Buuxi shaxda natiijada labada dhacdo: ka yar 12 iyo tiro kooban (prime).

	ka yar 12	aan ka yarayn 12
tiro kooban (prime)	2 5 7 11	13
aan tiro kooban ahayn	4 8 10	16 20



b) Raadi $P(\text{ka yar 12 iyo tiro kooban})$

$$= \frac{4}{10} = 0.4 = \frac{2}{5} = 40\%$$

c) Raadi $P(\text{aan tiro kooban ahayn iyo aan ka yarayn 12})$

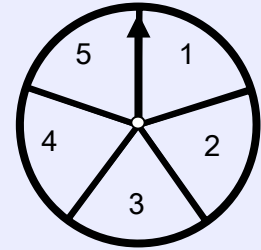
$$= \frac{2}{10} = 0.2 = \frac{1}{5} = 20\%$$

d) Raadi $P(\text{tiro kooban iyo aan ka yarayn 12})$

$$= \frac{1}{10} = 0.1 = 10\%$$

2) Wareegtan (spinner) laba jeer ayaa la wareejin doonaa, ka dibna isku dhufashada labada lambar ayaa la helayaa.

a) Buuxi shaxda natiijada si aad u muujiso isku dhufashada suurtagalka ah.



		wareejinta 1				
		1	2	3	4	5
wareejinta 2	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25

b) Raadi P(iska wareeg (square) iyo qaybiyaha 36)

$$= \frac{5}{25} = 0.2 = \frac{1}{5} = 20\%$$

c) Raadi P(xitaa (even) iyo ka yar 18)

$$= \frac{14}{25} = 0.56 = 56\%$$

3) Jadwalkan laba-geesoodka ah wuxuu muujinayaa inta jeer ee kubbadaha ciyaaraha qaarkood loo kala saaray qaabkooda iyo haddii ay leeyihiin tolidda (stitching) dusha.

tusaale ahaan, kubbadda american football ma aha spherical laakiin waxay leedahay tolidda (stitching), halka kubbadda golf-ka ay tahay spherical la'aan lahayn tolidda (stitching).



	spherical	aan spherical ahayn	wadarta
tolidda (stitching)	4	1	5
tolidda (stitching) la'aan	11	2	13
wadarta	15	3	18

Kubbad ayaa si random ah loo doortay.

a) Raadi $P(\text{wareegsan (spherical) iyo leh tolmo})$

$$\frac{4}{18}$$

b) Raadi $P(\text{spherical oo aan lahayn tolidda (stitching)})$

$$\frac{11}{18}$$

Qaabka casharka

Xisaabinta icmaalka aragtida (theoretical probabilities) laga soo qaaday
jadwalka laba-geesoodka ah (two-way tables) (laba dhacdo)



Ictimaalka aragtida (Theoretical probabilities)



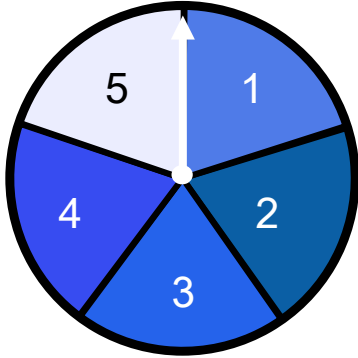
Ictimaalka dhacdooyinka isku-dhafa (Probabilities for combined events)

Ictimaalka dhacdooyinka isku-dhafan (Probabilities for combined events)



Sharaxaad

Wareegga (spinner) ayaa hal mar la wareejiyay.



	qaybiyaha (factor) 10	aan ahayn qaybiyaha (factor) 10
xataa (even)	2	4
kis (odd)	5 1	3

Waa maxay icmaalka (probability) in natiijadu tahay xataa (even) ama kis (odd)?

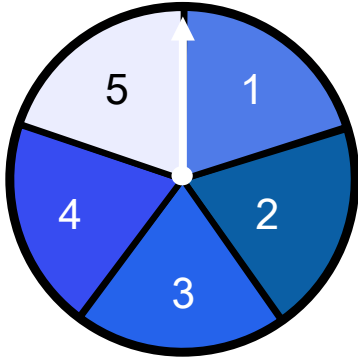
$$\frac{5}{5} = 1$$

Ictimaalka dhacdooyinka isku-dhafan (Probabilities for combined events)



Sharaxaad

Wareegga (spinner) ayaa hal mar la wareejiyay.



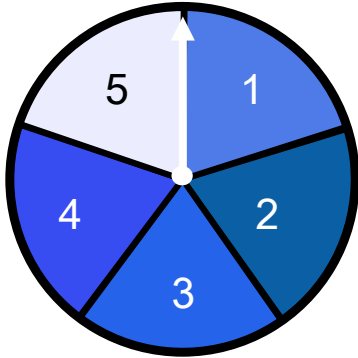
	faktor 10	ma aha faktor 10
xataa (even)	2	4
khariij (odd)	5	3

Waa maxay itimaalka (probability) in natiijadu tahay xataa iyo faktor 10 ama khariij iyo aan ahayn faktor 10?

$$\frac{2}{5}$$

Itimaalka (Probabilities) dhacdooyinka isku dhafan

Wareegga (spinner) waa la mariyay hal mar.



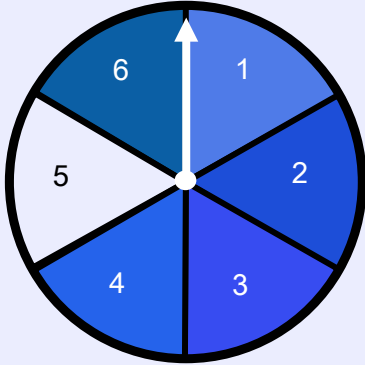
	faktor 10	ma aha faktor 10
xataa (even)	2	4
khariij (odd)	5 1	3

Waa maxay itimaalka in natiijadu tahay xataa iyo aan ahayn faktor 10 ama khariij?

$$\frac{4}{5}$$

Itimaalka (Probabilities) dhacdooyinka isku dhafan

Wareegga (spinner) waa la mariyay hal mar.



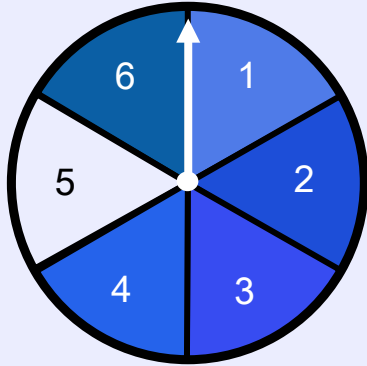
	faktor 8	ma aha faktor 8
xataa (even)	2 4	6
khariij (odd)	1	3 5

Waa maxay itimaalka in natiijadu tahay khariij iyo faktor 8 ama xataa?

$$\frac{4}{6}$$

Itimaalka (Probabilities) dhacdooyinka isku dhafan

Wareegga waa la wareejiyay hal mar.

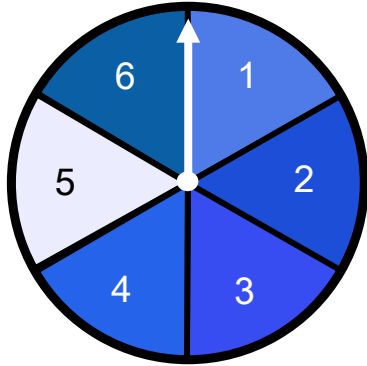


	qaybiyaha 8	ma aha qaybiyaha 8
xitaa (even)	2 4	6
khafif (odd)	1	3 5

Waa maxay ixtimaalka (probability) in natiijadu tahay khafif ama xitaa oo aan ahayn qaybiyaha 8?

$$\frac{4}{6}$$

Cabdi iyo Saciid waxay ciyaarayaan ciyaar wareeggan.



Cabdi wuxuu helayaa dhibic haddii wareeggu ku soo degto qaybiyaha 10.

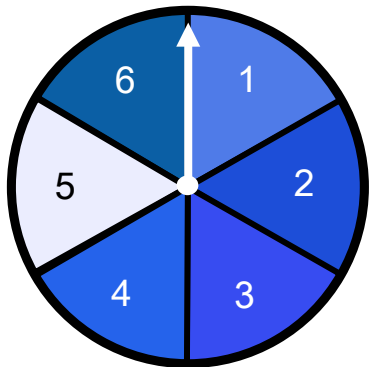
Saciid wuxuu helayaa dhibic haddii wareeggu ku soo degto tiro xitaa.

Waa maxay ixtimaalka in Cabdi iyo Saciid ay helaan dhibic?

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

	Cabdi wuxuu helayaa dhibic	Cabdi ma helayo dhibic
Saciid wuxuu helayaa dhibic	2	6 4
Saciid ma helayo dhibic	5 1	3

Cabdi iyo Saciid waxay ciyaarayaan ciyaar wareeggan.



Cabdi wuxuu helayaa dhibic haddii wareeggu (spinner) ku soo dego qayb ka mid ah 10.

Saciid wuxuu helayaa dhibic haddii wareeggu ku soo dego tiro siman (even number).

Waa maxay itimaalka (probability) in Cabdi ama Saciid helaan dhibic?

$$\frac{5}{10}$$

Cabdi wuxuu heli karaa dhibic, Saciidna ma helo

Saciid wuxuu heli karaa dhibic, Cabdina ma helo

Cabdi iyo Saciid labaduba waxay heli karaan dhibic

	Cabdi wuxuu helayaa dhibic	Cabdi ma helo dhibic
Saciid wuxuu helayaa dhibic	2	6 4
Saciid ma helo dhibic	5 1	3

Kee ka mid ah kuwan soo socda wuxuu buuxiyaa natiijo (outcome) ah tiro siman ama qayb ka mid ah 50?

a

Natiijadu waa tiro siman oo aan ahayn qayb ka mid ah 50



b

Natiijadu waa tiro siman oo ah qayb ka mid ah 50



c

Natiijadu waa tiro khariijad (odd) oo aan ahayn qayb ka mid ah 50

d

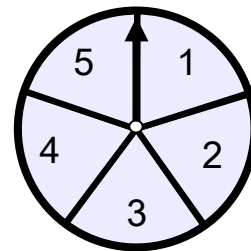
Natiijadu waa tiro khariijad oo ah qayb ka mid ah 50



Ciyaar baa la ciyaarayaa halkaas oo ciyaartoydu ku wareejiyaan (spinner) laba jeer oo ay helaan wadarta (sum) tirooyinkooda.

$A = \{\text{xataa (even)}\}$

$B = \{\text{in ka badan 5}\}$



	B	ma aha B	wadarta
A	9	4	13
ma aha A	6	6	12
wadarta	15	10	25

Waa maxay itimaalka (probability) in wadartu tahay xataa ama in ka badan 5?

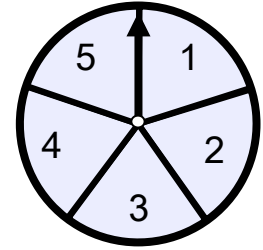
$$\frac{19}{25}$$

Ciyaar baa la ciyaarayaa halkaas oo ciyaartoydu ku wareejiyaan (spinner) laba jeer oo ay helaan wadarta (sum) tirooyinkooda.

$A = \{\text{xataa (even)}\}$

$B = \{\text{in ka badan 5}\}$

	B	ma aha B	wadarta (total)
A	9	4	13
ma aha A	6	6	12
wadarta (total)	15	10	25



Waa maxay itimaalka (probability) in wadartu tahay xataa ama in ka badan 5?

$$\frac{19}{25}$$

Waa maxay itimaalka in wadartu tahay xataa oo aan ka badnayn 5 ama in ka badan 5?

$$\frac{19}{25}$$

Dheg (dice) 8-dhinac leh, oo leh tirooyinka 1 ilaa 8.

Waa maxay itimaalka marka la rogrogo (rolled) inay ku soo degto qaybiyaha (factor) 8 (F) ama tiro kisi (odd number) (O)?

	F	ma aha F	wadarta (total)
O	1	3	4
ma aha O	3	1	4
wadarta (total)	4	4	8

$$\frac{7}{8}$$

1) Jadwalkan natiijada wuxuu muujinayaa meesha muunadda {1, 2, 3, 4, 5, 6, 7, 8, 9}.

Natiijo ayaa si random ah loo xulayaa.

Raadi itimaalka inay tahay:

a) xitaa (even) iyo qaybiyaha 18 ama khayaali (odd)

b) khayaali (odd) iyo qaybiyaha 18 ama xitaa (even)

c) qaybiyaha 18 ama xitaa (even) iyo ma aha qaybiyaha 18

d) ma aha qaybiyaha 18 ama xitaa (even)

	qaybiyaha 18	ma aha qaybiyaha 18
xitaa (even)	2 6	4 8
khayaali (odd)	1 3 9	5 7

1) Jadwalkan natiijada wuxuu muujinayaa meesha muunadda {1, 2, 3, 4, 5, 6, 7, 8, 9}.

Natiijo ayaa si random ah loo xulayaa.

Raadi itimaalka inay tahay:

a) xitaa (even) iyo qaybiyaha 18 ama khayaali (odd)

$$\frac{7}{9}$$

b) khayaali (odd) iyo qaybiyaha 18 ama xitaa (even)

$$\frac{7}{9}$$

c) qaybiyaha 18 ama xitaa (even) iyo ma aha qaybiyaha 18

$$\frac{7}{9}$$

d) ma aha qaybiyaha (factor) 18 ama xataa

$$\frac{6}{9}$$

	qaybiyaha 18	ma aha qaybiyaha 18
xitaa (even)	2 6	4 8
khayaali (odd)	1 3 9	5 7

Miisaska natiijada waxaa loo isticmaali karaa in lagu helo ixtimaalka aragtida ee dhacdooyinka isku dhafan (theoretical probabilities).

In some combinations, an outcome appears in both and therefore is only included once.