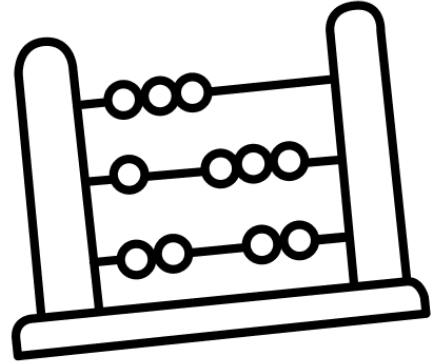


Xisaabinta ixtimaalka (theoretical probabilities) ee jaantusyada Venn (hal dhacdo)

Maths

Cutub: Ixtimaalka: ixtimaalka (theoretical probabilities)



Natiijo

Waxaan ka heli karaa ixtimaalka (theoretical probabilities) jaantuska Venn oo muujinaya natiijooyinka suurtagalka ah ee hal dhacdo.

Erayada muhiimka ah

Jaantusyada Venn waa matalaad loo isticmaalo qaabaynta su'aalaha tirakoobka/ixtimaalka. Caadi ahaan goobo ayaa loo isticmaalaa inay matalaan dhacdooyinka.

Ixtimaalka (theoretical probability) waa ixtimaal ku salaysan tirinta tirada natiijooyinka la doonayo ee booska muunadda (sample space) halkaas oo dhammaan natiijooyinka shaqsiga ah ay isku ekaansho yihiin.

Xisaabinta ixtimaalka (theoretical probabilities) ee jaantusyada Venn (hal dhacdo)



Ixtimaalka (theoretical probabilities) ee jaantusyada Venn



Isbarbardhigga ixtimaalka

Jaantuska Venn wuxuu muujinayaa booska muunadda (sample space), oo loo kala saaray laba dhacdo.

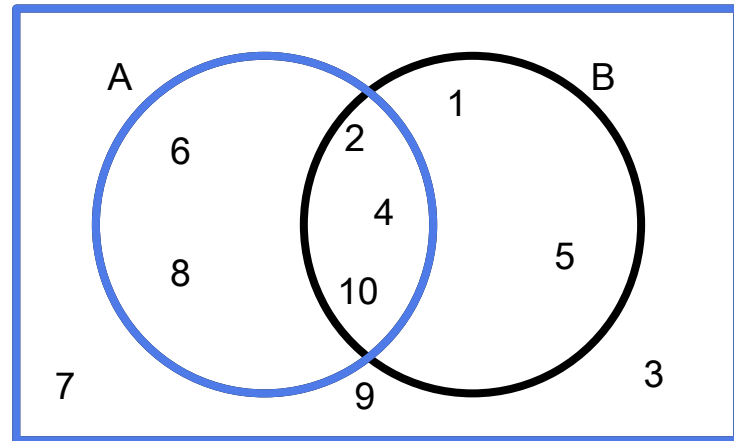
Haddii dhammaan natiijooyinka ay isku ekaansho yihiin in la doorto, waa maxay ixtimaalka in natiijo ka mid ah dhacdada A la doorto? ξ

$$P(A) = \frac{5}{10}$$

ixtimaalka dhacdo A

5 — natiijooyinka dhacdada A

10 — natiijooyinka booska muunadda (sample space)



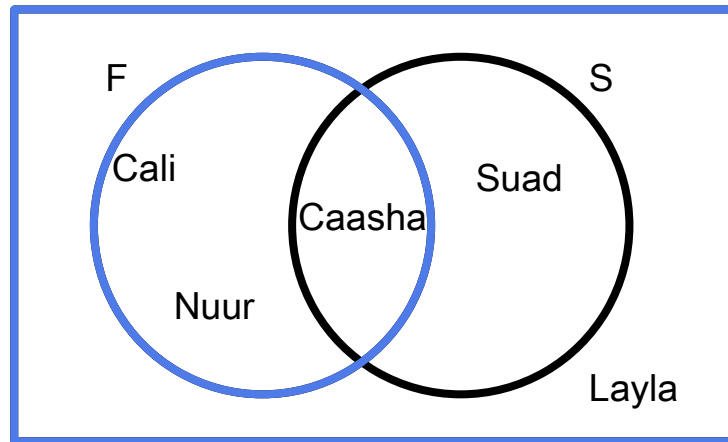
Isticmaalka jaantuska Venn waxaan sheegi karnaa
itimaalka dhacdooyinka keli ah.

$$P(F) = \frac{3}{5}$$

3 — natiijooyinka dhacdada F
5 — natiijooyinka booska muunadda

itimaalka in ardaygu barto
Faransiis

ξ



Laba dhacdo waa:

$F = \{\text{barashada Faransiiska}\}$

$S = \{\text{barashada Isbaanishka}\}$

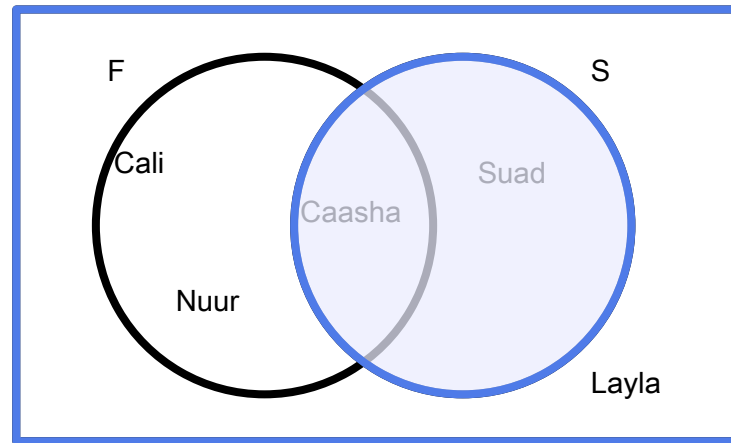
Isticmaalka jaantuska Venn waxaan sheegi karnaa itimaalka dhacdooyinka keli ah.

$$P(\text{ma } S) = \frac{3}{5}$$

3 — natiijooyinka aan ku jirin dhacdada S
5 — natiijooyinka booska muunadda

itimaalka in ardaygu aanu baran Isbaanish

ξ



Laba dhacdo waa:

$F = \{\text{barta Faransiis}\}$

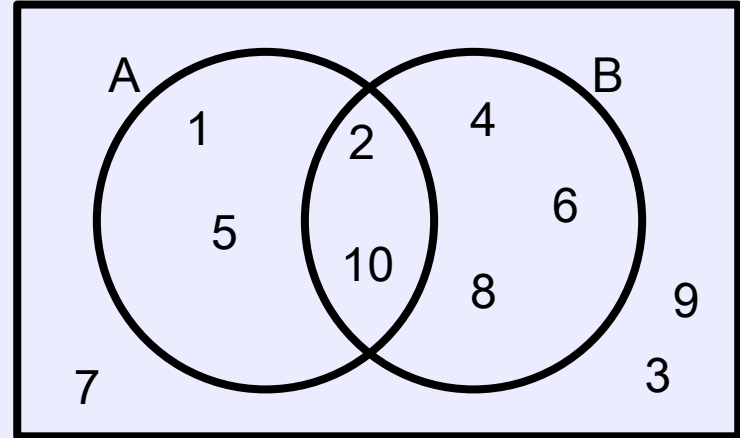
$S = \{\text{barta Isbaanish}\}$

Itimaalka aragtida ee jaantusyada Venn

Isticmaal jaantuska Venn si aad u xisaabiso itimaalka.

$$P(B) = \frac{5}{10}$$

$$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

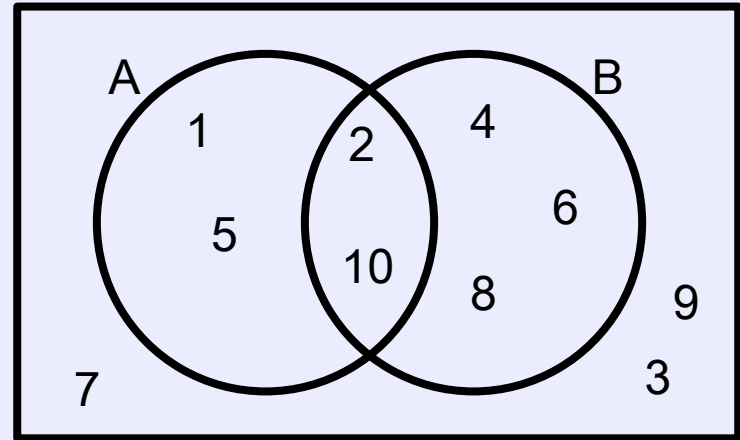


Itimaalka (probability) aragtida ee jaantusyada Venn

Isticmaal jaantuska Venn si aad u xisaabiso itimaalka (probability).

$$P(\text{not } A) = \frac{6}{10}$$

$$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$



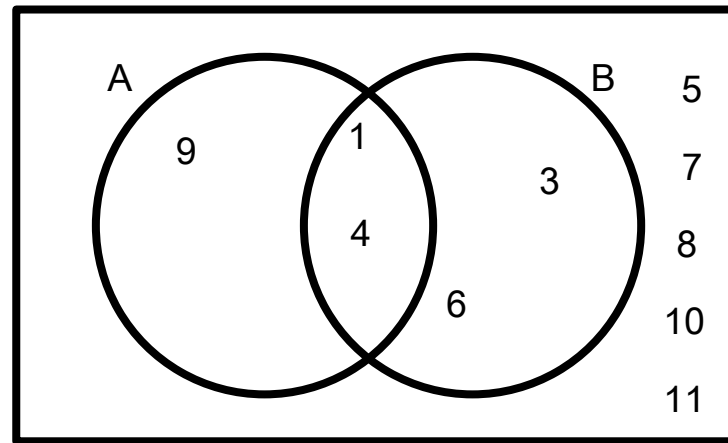
Laba natijood oo ka mid ah booska muunadda ayaa ka maqan jaantuska Venn.

Waa kuwee labada? 2 iyo 12

Iyada oo aan la garanayn natiijooyinka dhacdo kasta, ma aanan ku dari karin jaantuska.

Haddii aan ognahay itimaalka (probability) doorashada natiijo ka mid ah dhacdo kasta, ma caawin kartaa in lagu meeleezo jaantuska Venn?

$$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$$



Itimaalka (probability) aragtida ee jaantusyada Venn

Marka la eego $\times 3$

$$P(A) = \frac{1}{4} = \frac{3}{12}$$

$\times 3$

$\times 6$

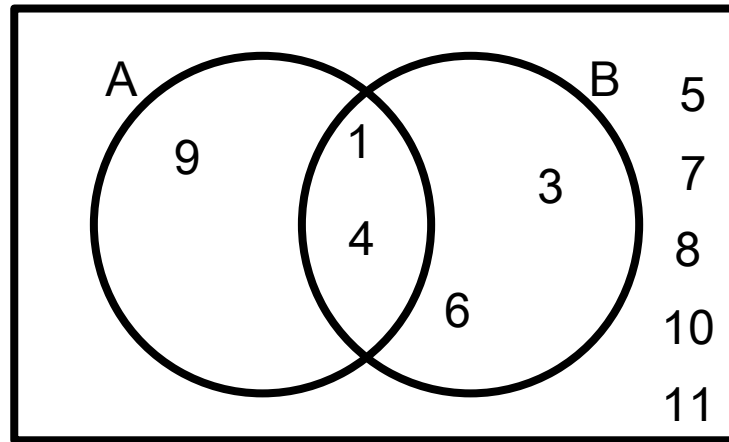
$$P(B) = \frac{1}{2} = \frac{6}{12}$$

$\times 6$

Waxaa horey u jiray 3 natiijo oo ku jira dhacdada A.

Waxaa loo baahan yahay in ay jiraan 6 natiijo oo ku jira dhacdada B.

$$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$$



Sidaas darteed natiijooyinka maqan 2 iyo 12 waa natiijooyinka dhacdada B.



Taas macneheedu waa natiiyooyinka 2 iyo 12 waxay u baahan yihiin inay ku jiraan meel kasta oo ka mid ah goobada dhacdada B.



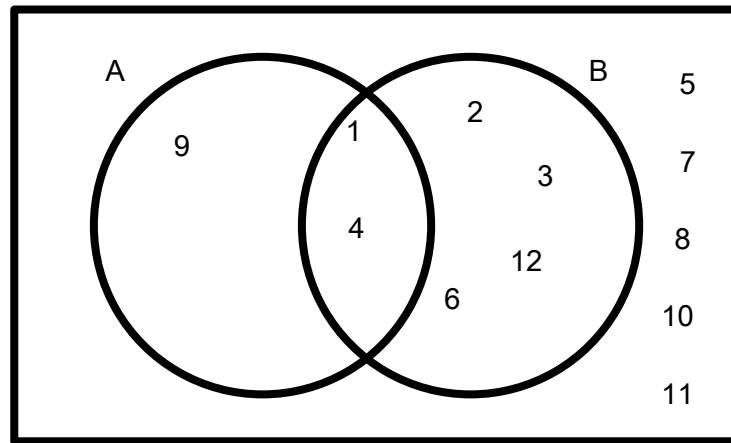
Cali

Ma aha meel kasta! Dhacdada A waxay horey u leedahay 3 natiiyo, waa inay ku jiraan goobta B kaliya.



Layla

$$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$$



Itimaalka (probability) aragtida ee jaantusyada Venn

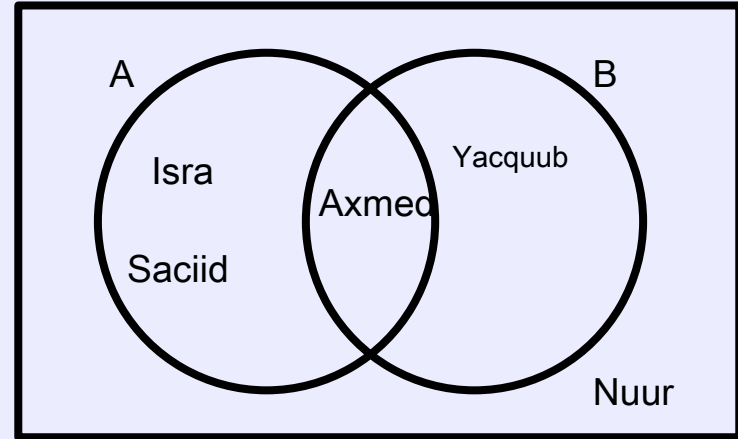
Marka la eego:

$$P(A) = \frac{3}{5}$$

$$P(B) = \frac{2}{5}$$

Dhamaystir jaantuska Venn (Venn diagram).

$\xi = \{\text{Axmed, Nuur, Yacquub, Saciid, Isra}\}$



Jaantuskan Venn wuxuu muujinayaa tirada natiijooyinka (outcomes) ee dhacdo kasta (event).

Imisa natiijo (outcome) ayaa ka jira booska muunadda (sample space)?

$$5 + 3 + 3 + 4 = 15$$

Imisa natiijo (outcome) ayaa ka jira dhacdada A (event A)?

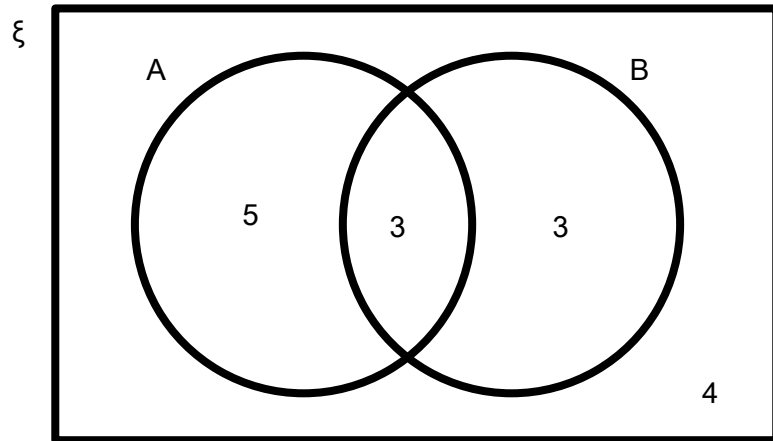
$$5 + 3 = 8$$

Imisa natiijo (outcome) ayaa ku jira oo kaliya dhacdada B (event B)?

$$3$$

Imisa natiijo (outcome) ayaan ku jirin dhacdada A (event A)?

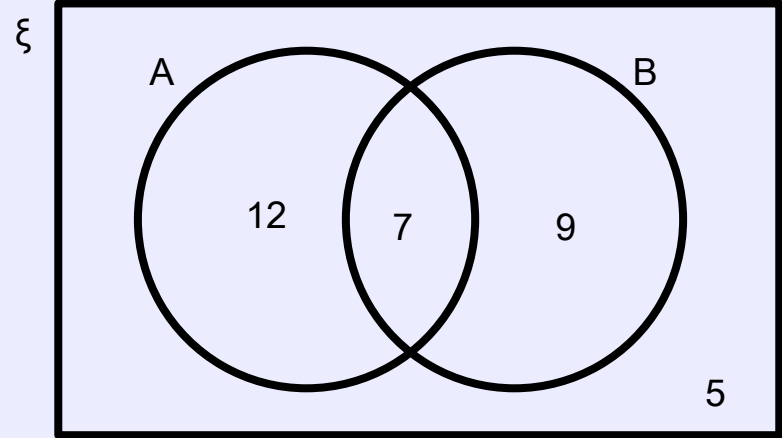
$$3 + 4 = 7$$



Jaantuskan Venn wuxuu muujinayaa tirada natiijooyinka (outcomes) ee dhacdo kasta (event).

Imisa natiijo (outcome) ayaan ku jirin dhacdada B (event B)?

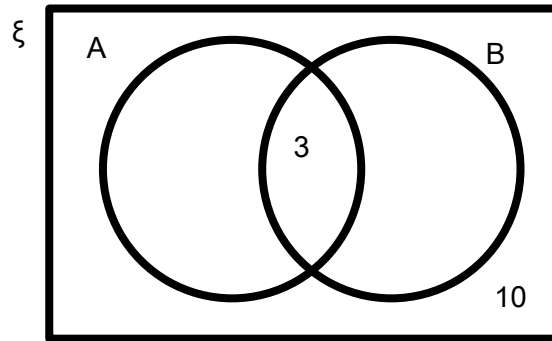
$$12 + 5 = 17$$



Jaantuskan Venn wuxuu muujinayaa tirada natiijooyinka (outcomes) ee dhacdo kasta (event). Waxaa jira 18 natiijo (outcome) oo ku jira booska muunadda (sample space).

Waxaa ka maqan qaar ka mid ah tirooyinka.

$$\frac{13}{18}$$



waxay ka dhigan tahay in tirada natiijooyinka (outcomes) ee gobolka (region) u taagan oo kaliya B ay tahay 3.

Marka 2 natiijo (outcome) ee u dambeeya waxay ku jiraan gobolka (region) u taagan oo kaliya dhacdada A (event A).

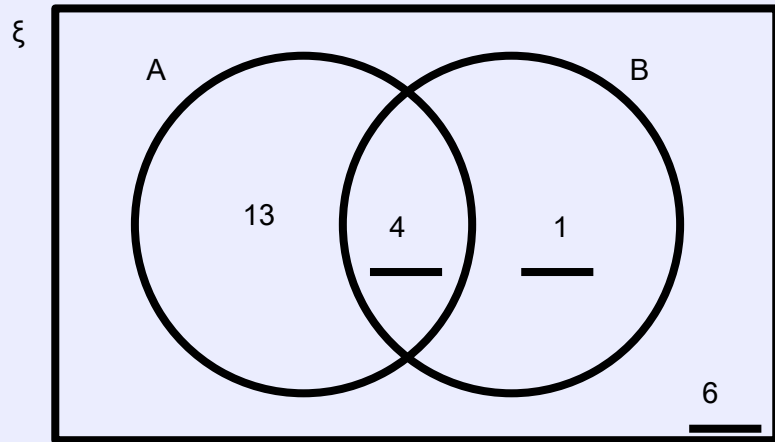
Jaantuska Venn wuxuu muujinayaa tirada natiijooyinka dhacdo kasta. Meesha muunaddu waxay leedahay 24 natiijo.

La siiyay:

$$P(\text{not } B) = \frac{19}{24}$$

$$P(A) = \frac{17}{24}$$

Dhammeystir jaantuska Venn.



1) Isticmaal jaantuska Venn si aad u qorto ixtimaallada.

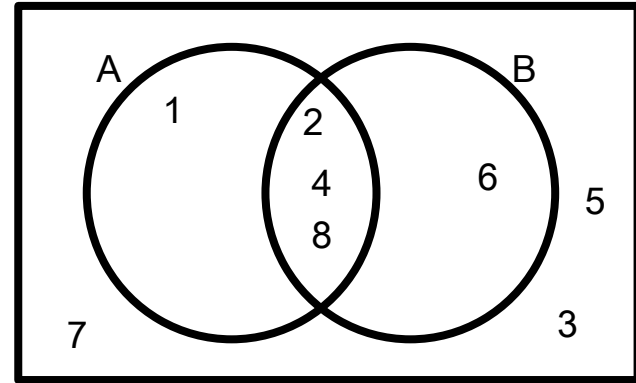
a) $P(A) =$

b) $P(B) =$

c) $P(\text{not } B) =$

d) $P(\text{only } A) =$

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



2) Isticmaal jaantuska Venn si aad u qorto ixtimaallada.

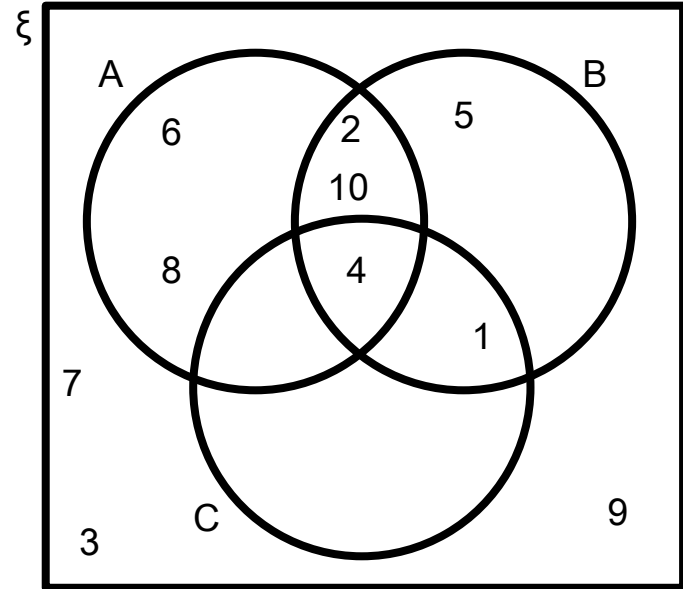
a) $P(A) =$

b) $P(B) =$

c) $P(C) =$

d) $P(\text{only } B) =$

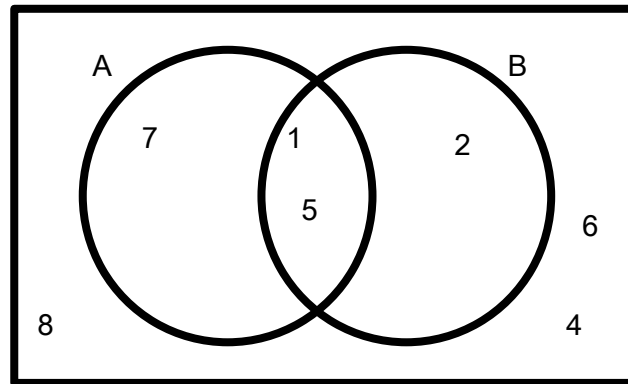
e) $P(\text{not } C) =$



3)

a) Dhammeystir jaantuska Venn adigoo la siiyay ixtimaalladan.

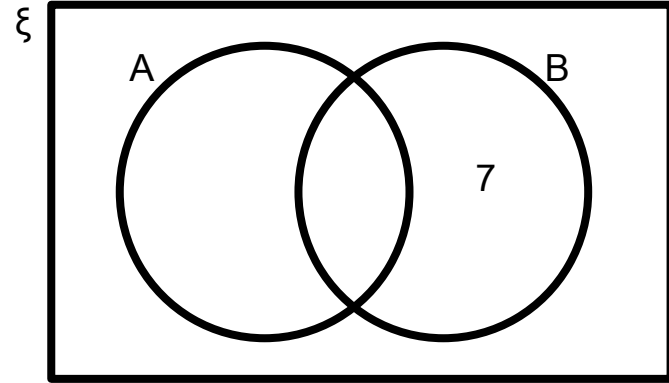
$$P(A) = \frac{1}{2}$$
$$P(B) = \frac{3}{8}$$

b) Soo saar $P(\text{only } A)$ $\xi = \{\text{tirooyin (integers) 1 ilaa 8 oo ay ku jiraan}\}$ 

4) Jaantuskan Venn wuxuu muujinayaa tirada natiijooyinka dhacdo kasta.

Waxaa jira 21 natiijo oo ku yaal meesha muunaddu.

Dhammeystir jaantuska Venn adigoo la siiyay ixtimaalladan.



$$P(\text{not } A) = \frac{13}{21}$$

$$P(\text{kaliya } A) = \frac{1}{7}$$

1) Isticmaal jaantuska Venn (Venn diagram) si aad u qorto itimaalka (probabilities).

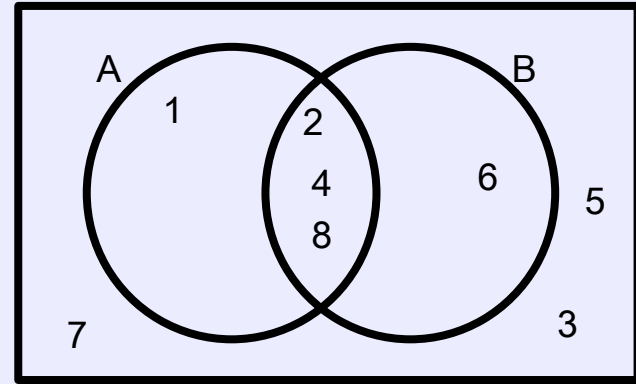
$$\text{a) } P(A) = \frac{4}{8} = \frac{1}{2} = 50\% = 0.5$$

$$\text{b) } P(B) = \frac{4}{8} = \frac{1}{2} = 50\% = 0.5$$

$$\text{c) } P(\text{ma aha } B) = \frac{4}{8} = \frac{1}{2} = 50\% = 0.5$$

$$\text{d) } P(\text{kaliya } A) = \frac{1}{8} = 12.5\% = 0.125$$

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



2) Isticmaal jaantuska Venn (Venn diagram) si aad u qorto itimaalka (probabilities).

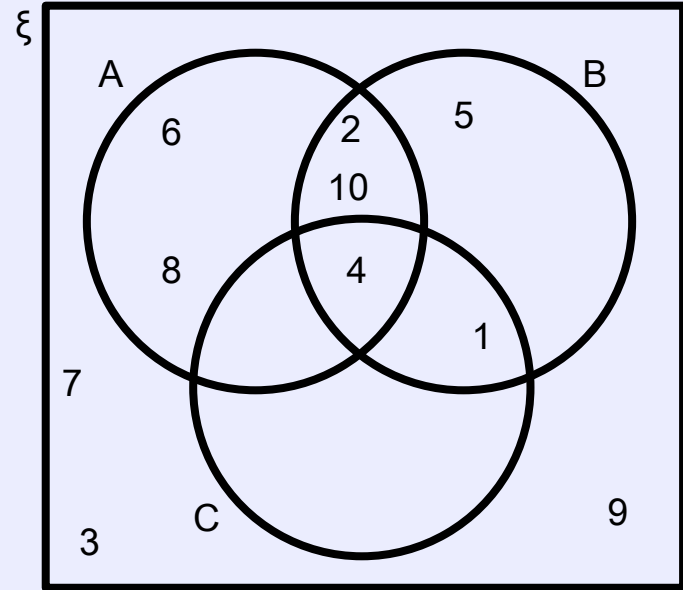
$$a) P(A) = \frac{5}{10} = \frac{1}{2} = 50\% = 0.5$$

$$b) P(B) = \frac{5}{10} = \frac{1}{2} = 50\% = 0.5$$

$$c) P(C) = \frac{2}{10} = \frac{1}{5} = 20\% = 0.2$$

$$d) P(\text{kaliya B}) = \frac{1}{10} = 10\% = 0.1$$

$$e) P(\text{ma aha C}) = \frac{8}{10} = \frac{4}{5} = 80\% = 0.8$$



3)

a) Dhammaystir jaantuska Venn (Venn diagram) adigoo ku saleynaya itimaalkan (probabilities).

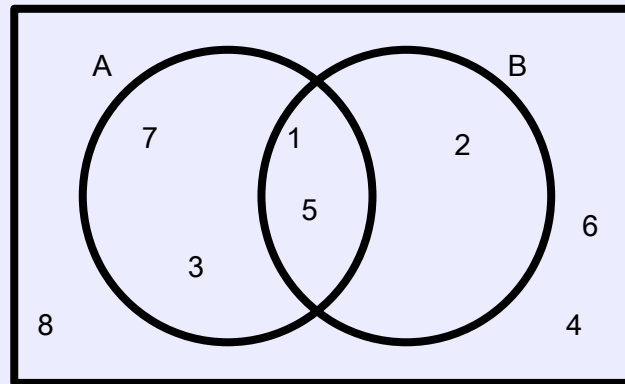
$$P(A) = \frac{1}{2}$$

$$P(B) = \frac{3}{8}$$

b) Soo saar $P(\text{kaliya } A)$

$$\frac{2}{8} = \frac{1}{4} = 25\% = 0.25$$

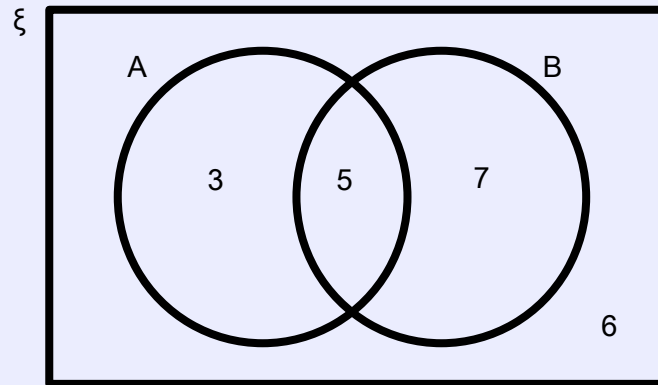
$\xi = \{\text{tirsanayaasha (integers) 1 ilaa 8 oo ay ku jiraan}\}$



4) Jaantuskan Venn (Venn diagram) wuxuu muujinayaa tirada natiijooyinka (outcomes) ee dhacdo kasta.

Waxaa jira 21 natiijo (outcomes) oo ku jira booska muunadda (sample space).

Dhammaystir jaantuska Venn (Venn diagram) adigoo ku saleynaya itimaalkan (probabilities).



$$P(\text{ma aha } A) = \frac{13}{21}$$

$$P(\text{kaliya } A) = \frac{1}{7}$$

Qaabka casharka

Xisaabinta itimaalka aragtida (Theoretical probabilities) ee jaantusyada Venn (Venn diagrams) (hal dhacdo)



Itimaalka aragtida (Theoretical probabilities) ee jaantusyada Venn (Venn diagrams)

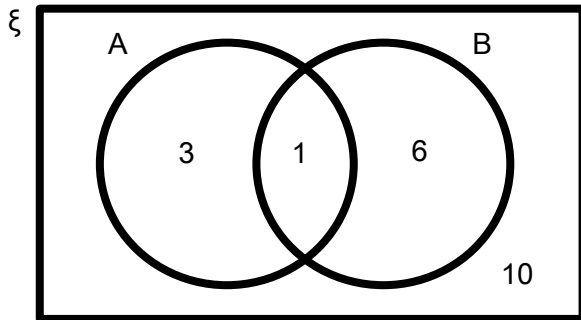


Isbarbardhigga itimaalka (Comparing probabilities)

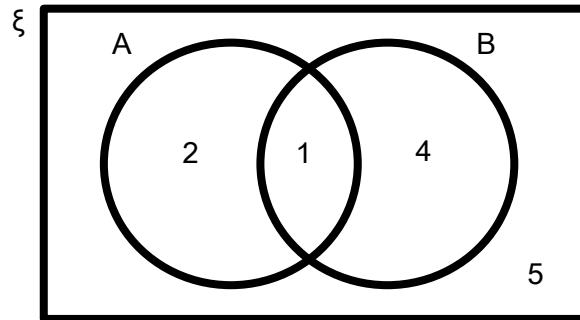
Caasha iyo Suad waxay ciyaarayaan laba ciyaarood oo kala duwan. Tirada natiijooyinka ayaa ku muujisan labada jaantus ee Venn.

Caasha waa ku guuleysataa haddii ay doorato natiijo ka mid ah dhacdada A ee ciyaar kasta, Suadna waa ku guuleysataa haddii ay doorato natiijo ka mid ah dhacdada B ee ciyaar kasta.

Ciyaarta 1

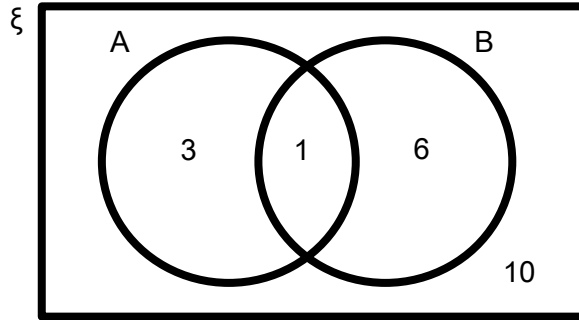


Ciyaarta 2

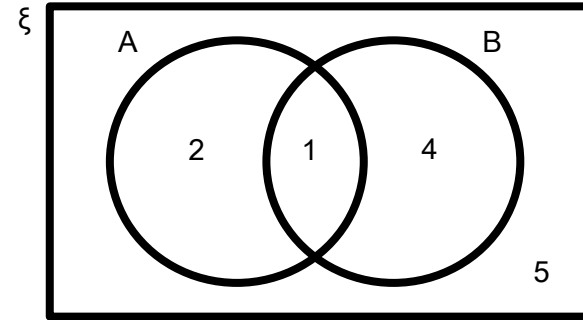


Ciyaar tee ayay Caasha tahay inay ciyaarto?

Ciyaarta 1



Ciyaarta 2



Ciyaar tee ayay Caasha tahay inay ciyaarto?

Ciyaarta 1, waxaa jira 4 natiijo oo dhacda A ah, marka la barbardhigo 3 ee ciyaarta 2.



Yacquub

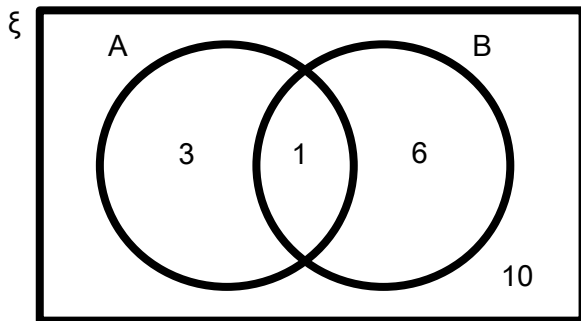
Ciyaarta 2, sababtoo ah $P(A) = 0.25$, halka ciyaarta 1, $P(A) = 0.2$



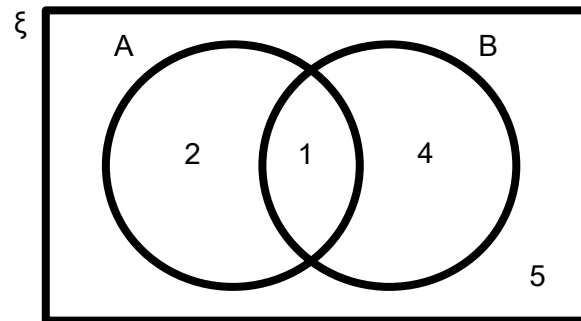
Nuur

Yaa aad ku raacsan tahay?

Ciyaarta 1



Ciyaarta 2



Ciyaar tee ayay Suad tahay inay ciyaarto?

Haa, waxaan u baahanahay inaan eego fursadda doorashada natiijo ka mid ah dhacdada B.



Yacquub

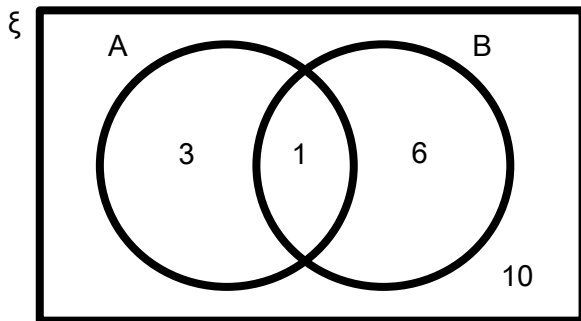
Ciyaartii 1aad, Suad waxay leedahay fursad 35% ah oo ay ku guuleysato. Ciyaartii 2aad waxay leedahay fursad oo ay ku guuleysato.

$$\frac{5}{12}$$



Nuur

Ciyaartii 1aad



Ciyaartee ayay Suad tahay inay ciyaarto?

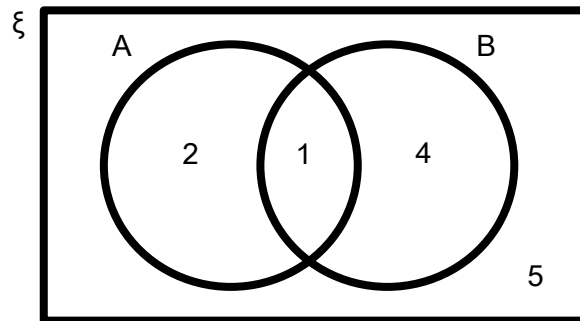
Kee weyn yahay, 35% ama ?

$$\frac{5}{12}$$



Yacquub

Ciyaartii 2aad



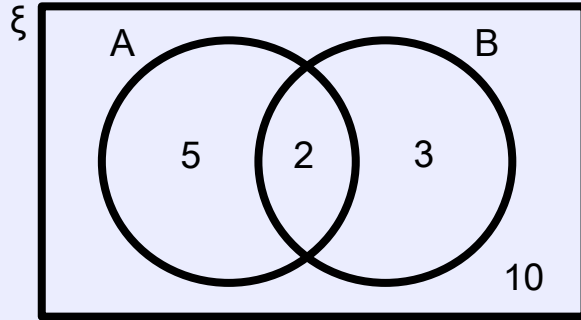
35% waxay la mid tahay $\frac{7}{20}$

Si loo barbardhigo jajabyo (fractions), waxaan isticmaali karnaa hooseeye guud (common denominator).

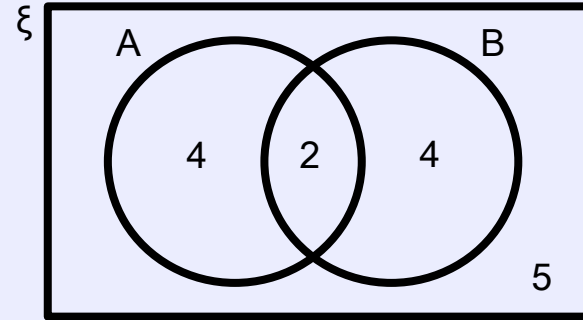
$$\frac{7}{20} = \frac{21}{60} < \frac{5}{12} = \frac{25}{60}$$

Suad waxay u badan tahay inay ku guuleysato ciyaarta 2aad.

Ciyaartii 1aad



Ciyaartii 2aad



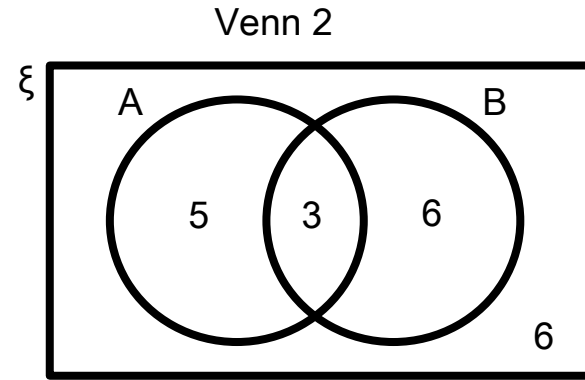
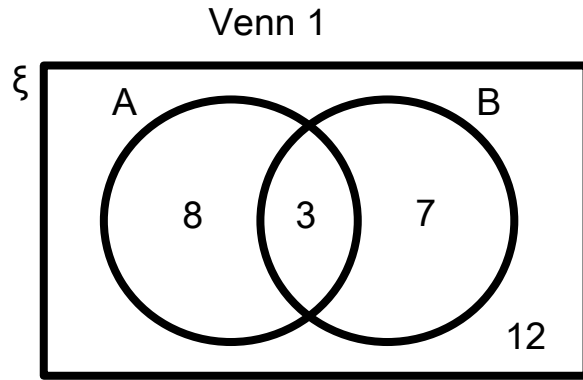
Ciyaartee ayaad u badan tahay inaad ka doorato natiijo (outcome) ka tirsan dhacdada A (event A)?

Ciyaartii 1aad: $P(A) = \frac{7}{20}$

Ciyaartii 2aad: $P(A) = \frac{6}{15} = \frac{2}{5} = \frac{8}{20}$

Ciyaartii 2aad

1) Barbardhigi ixtimaalka (probabilities) ka imanaya jaantus kasta oo Venn (Venn diagram). Jaantusyada Venn waxay muujinayaan tirada natiijooyinka (outcomes).

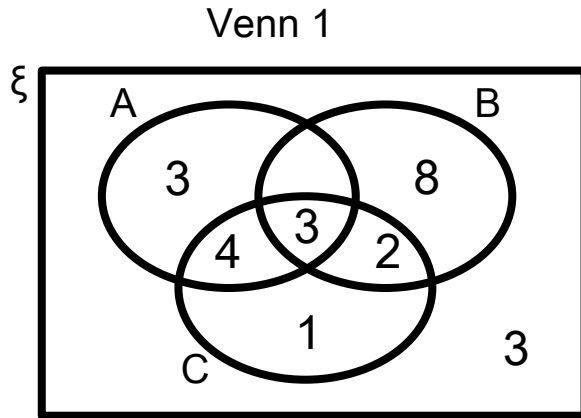


a) $P(A)$

b) $P(\text{kaliya } A)$

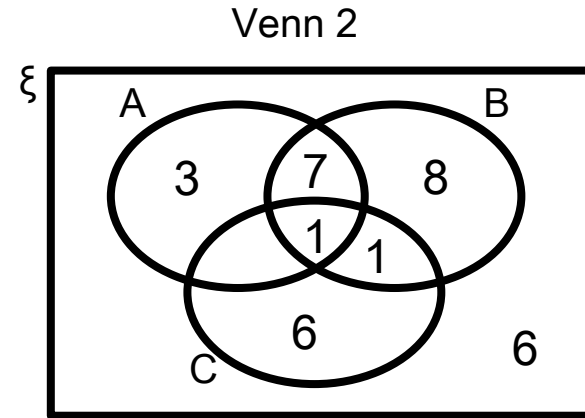
c) $P(\text{ma } B)$

2) Isbarbardhig itimaalka Venn diagram kasta. Venn diagrams waxay muujinayaan tirada natiijooyinka.



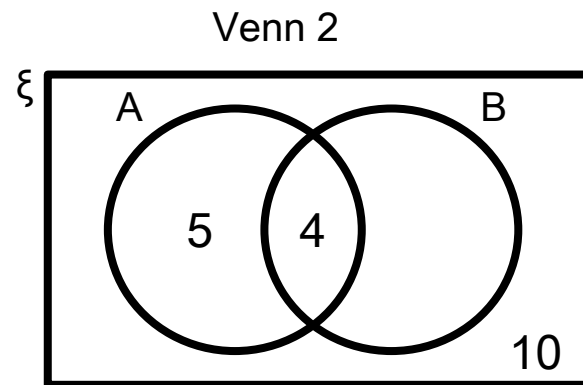
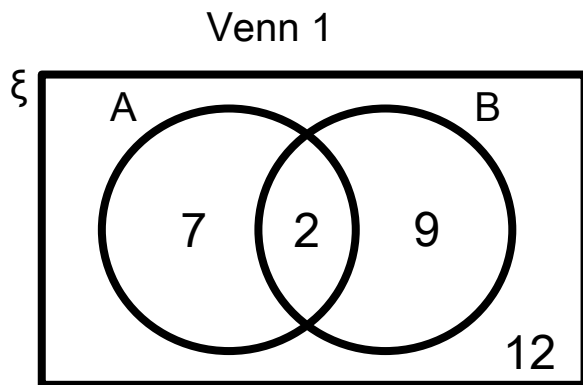
a) $P(A)$

b) $P(C)$



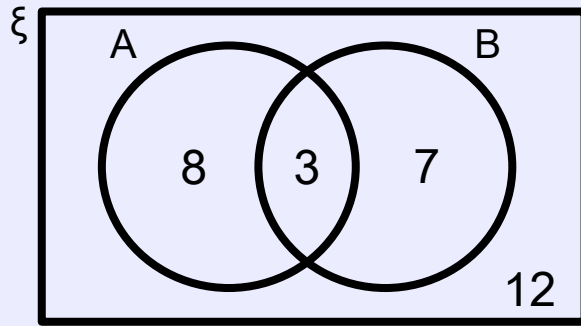
c) $P(\text{ma } B)$

3) Buuxi Venn diagram labaad tirada natiijooyinka si aad ugu dhowdahay inaad doorato natiijo ka mid ah dhacdada B ee Venn 2.

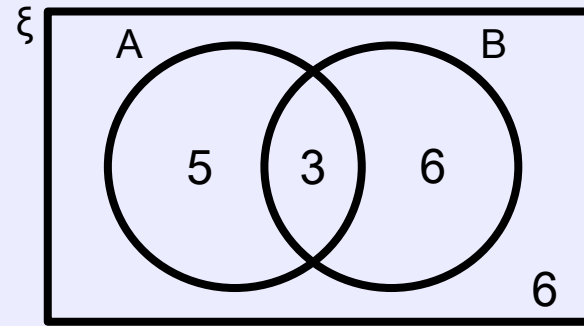


1) Isbarbardhig itimaalka Venn diagram kasta. Venn diagrams waxay muujinayaan tirada natiijooyinka.

Venn 1



Venn 2



a) $P(A)$

Venn 1:

$$P(A) = \frac{8}{12} = \frac{2}{3}$$

$$\frac{11}{30} \quad \frac{22}{60}$$

Venn 2:

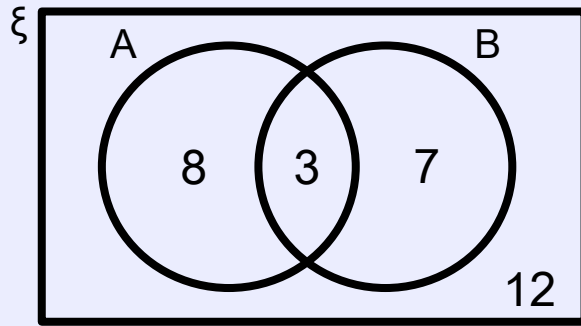
$$P(A) = \frac{5}{6} = \frac{5}{6}$$

$$\frac{8}{20} \quad \frac{24}{60}$$

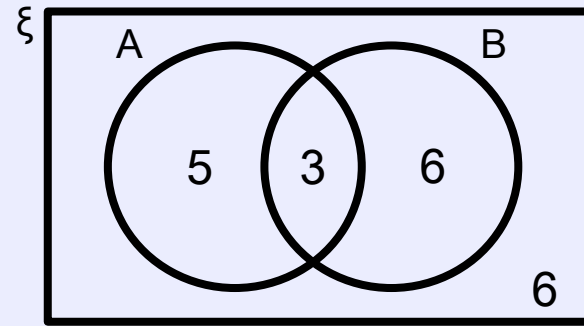
Marka dhacdada A ayaa ku dhowdahay Venn 2.

1) Isbarbardhig itimaalka Venn diagram kasta. Venn diagrams waxay muujinayaan tirada natiijooyinka.

Venn 1



Venn 2



b) $P(\text{kaliya } A)$

Venn 1:

$P(\text{kaliya } A) = \frac{8}{12}$

$$\frac{8}{30} \quad \frac{16}{60}$$

Venn 2:

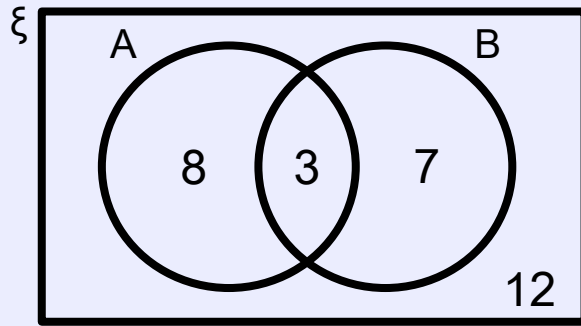
$P(\text{kaliya } A) = \frac{5}{6}$

$$\frac{5}{20} \quad \frac{15}{60}$$

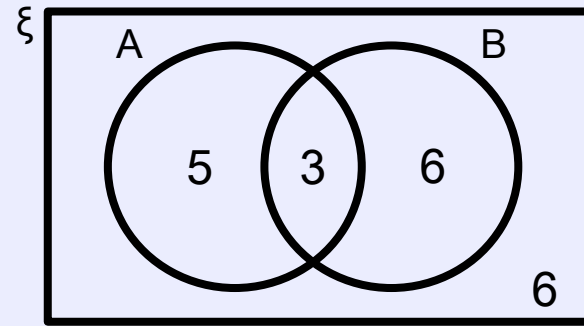
Marka dhacdada A oo keliya ayaa u badan Venn 1.

1) Isbarbardhig itimaalka (probabilities) jaantus kasta oo Venn ah. Jaantusyada Venn waxay muujinayaan tirada natiijooyinka (outcomes).

Venn 1



Venn 2



c) $P(\text{ma aha B})$

Venn 1:

$P(\text{ma aha B}) = \frac{7}{12}$

$$\frac{20}{30} = \frac{40}{60}$$

Venn 2:

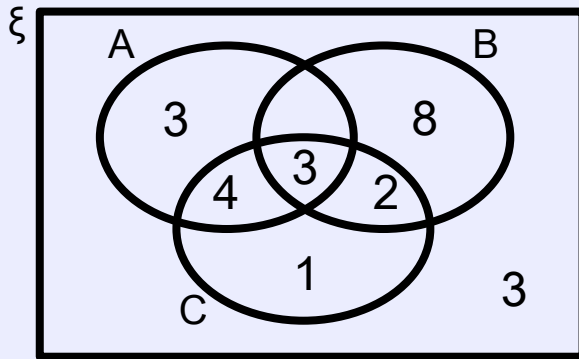
$P(\text{ma aha B}) = \frac{6}{11}$

$$\frac{11}{20} = \frac{33}{60}$$

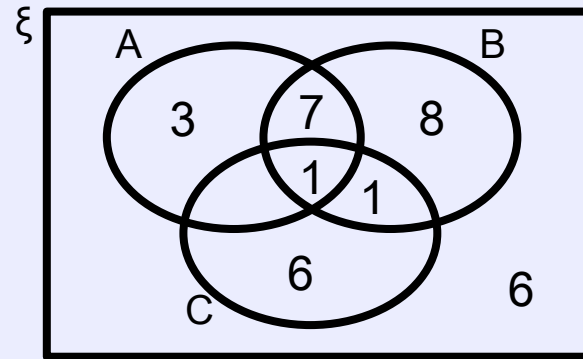
Marka dhacdada ma aha B ayaa u badan Venn 1.

2) Isbarbardhig itimaalka (probabilities) jaantus kasta oo Venn ah. Jaantusyada Venn waxay muujinayaan tirada natiijooyinka (outcomes).

Venn 1



Venn 2



a) $P(A)$

Venn 1:

$P(A) =$

$$\frac{10}{24} = \frac{40}{96}$$

Venn 2:

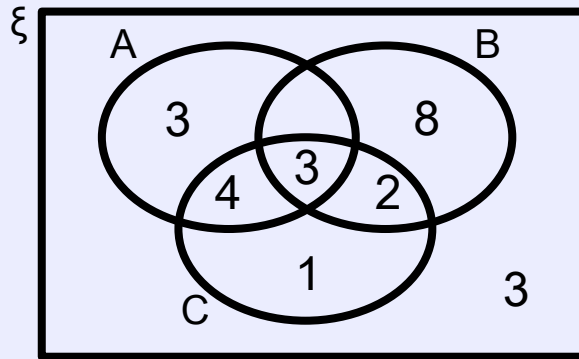
$P(A) =$

$$\frac{11}{32} = \frac{33}{96}$$

Marka dhacdada A ayaa u badan Venn 1.

2) Isbarbardhig ixtimaalka (probabilities) ee Venn diagram kasta. Venn diagrams-ku waxay muujinayaan tirada natiijooyinka (outcomes).

Venn 1

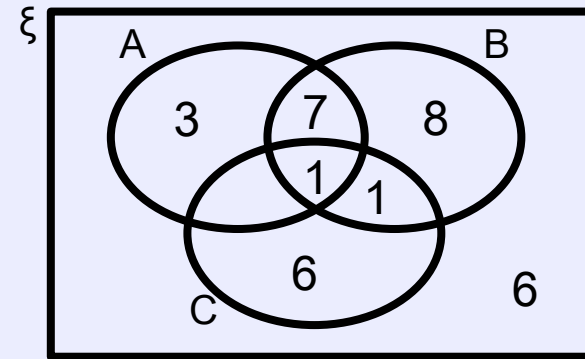


Venn 1:

$$P(C) = \frac{10}{24}$$

$$\frac{10}{24} = \frac{40}{96}$$

Venn 2



Venn 2:

$$P(C) = \frac{8}{32}$$

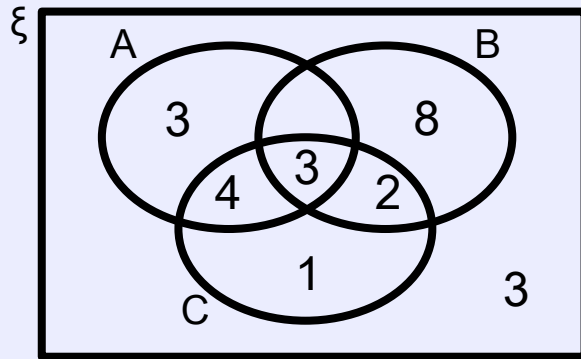
$$\frac{8}{32} = \frac{24}{96}$$

Marka dhacdada (event) C waxay u badan tahay Venn 1.

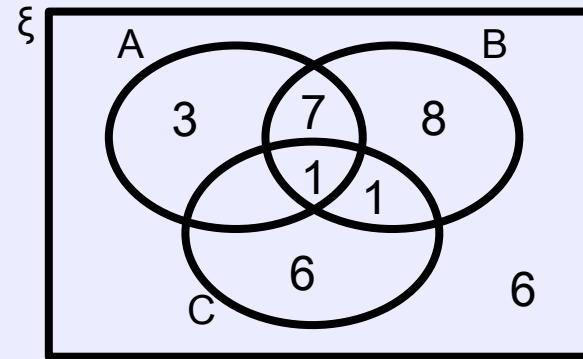
b) $P(C)$

2) Isbarbardhig ixtimaalka (probabilities) ee Venn diagram kasta. Venn diagrams-ku waxay muujinayaan tirada natiijooyinka (outcomes).

Venn 1



Venn 2



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

Venn 1:

$P(\text{not } B) =$

$$\frac{11}{24} \quad \frac{44}{96}$$

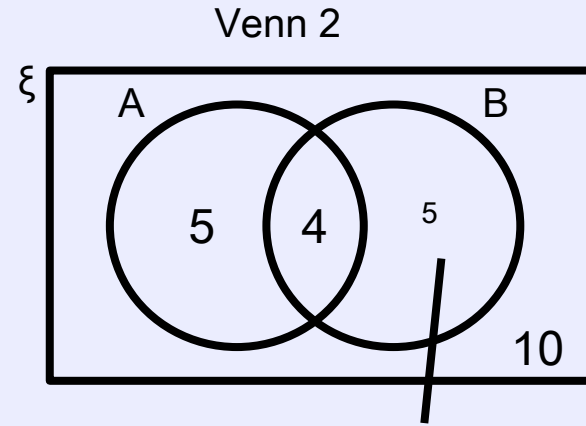
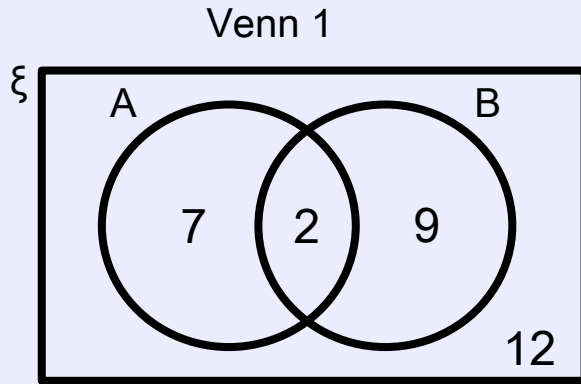
Venn 2:

$P(\text{not } B) =$

$$\frac{15}{32} \quad \frac{45}{96}$$

Marka dhacdada (event) B ee aan ahayn waxay u badan tahay Venn 2.

3) Buuxi Venn diagram-ka labaad ee tirada natiijooyinka (outcomes) si aad ugu badan tahay inaad ka doorato natiijo (outcome) dhacdada (event) B ee Venn 2.



Tiro kasta oo ka weyn 4

Soo koobid

Xisaabinta ixtimaalka (theoretical probabilities) jaantusyada Venn (Venn diagrams) (hal dhacdo (event))

Waxaa laga heli karaa ixtimaalka (theoretical probabilities) dhacdooyinka (events) iyadoo la isticmaalayo jaantuska Venn (Venn diagram).

Waxaa suurto gal ah in la xisaabiyo halka natiijooyinka (outcomes) maqan ay ku habboon yihiin jaantuska Venn (Venn diagram) haddii ixtimaalka (probabilities) dhacdooyin (events) ku filan la ogyahay.