

Excel Matematik SPM
Tingkatan 4 Bab 9
Kebarangkalian Peristiwa Bergabung
Penyelesaian Lengkap

Praktis Formatif 9.1

- 1 (a) (i) Peristiwa mendapat gandaan 3 atau faktor bagi 12, iaitu $A \cup B$
(ii) Peristiwa mendapat gandaan 3 dan faktor bagi 12, iaitu $A \cap B$
(b) (i) $A \cup B = \{1, 2, 3, 4, 6, 9, 12\}$
(ii) $A \cap B = \{3, 6, 12\}$
- 2 (a) (i) Peristiwa bahawa nombor pertama ialah nombor genap atau nombor terakhir ialah nombor ganjil, iaitu $P \cup Q$
(ii) Peristiwa bahawa nombor pertama ialah nombor genap dan nombor terakhir ialah nombor ganjil, iaitu $P \cap Q$
(b) (i) $P \cup Q = \{618, 681, 816, 861\}$
(ii) $P \cap Q = \{681, 861\}$

Praktis Formatif 9.2

- 1 (a) Tak bersandar
(b) Bersandar
(c) Tak bersandar

2

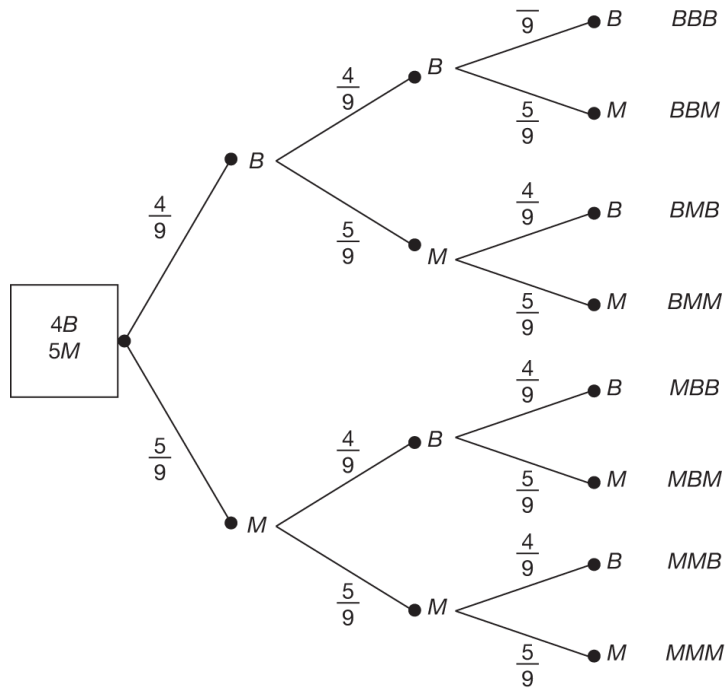
Kotak B Kotak A \	1	2	3
1	(1, 1)	(1, 2)	(1, 3)
2	(2, 1)	(2, 2)	(2, 3)
3	(3, 1)	(3, 2)	(3, 3)
4	(4, 1)	(4, 2)	(4, 3)

- (a) $\frac{7}{12}$ (b) $\frac{1}{6}$

- 3 $S = \{(R, 2), (R, 3), (R, 7), (R, 8), (U, 2), (U, 3), (U, 7), (U, 8)\}$
(a) $\{(R, 3), (R, 7), (U, 2), (U, 3), (U, 7), (U, 8)\}$
 $\frac{3}{4}$
(b) $\{(R, 2), (R, 3), (R, 7)\}$
 $\frac{3}{8}$

- 4 (a) P(ketiga-tiga mereka mengenai sasaran)
 $= \frac{2}{5} \times \frac{3}{4} \times \frac{2}{3} = \frac{1}{5}$
(b) P(hanya seorang mengenai sasaran)
 $= \left(\frac{2}{5} \times \frac{1}{4} \times \frac{1}{3}\right) + \left(\frac{3}{5} \times \frac{3}{4} \times \frac{1}{3}\right) + \left(\frac{3}{5} \times \frac{1}{4} \times \frac{2}{3}\right)$
 $= \frac{1}{30} + \frac{3}{20} + \frac{1}{10}$
 $= \frac{17}{60}$
(c) P(sekurang-kurangnya seorang mengenai sasaran)
 $= 1 - \frac{3}{5} \times \frac{1}{4} \times \frac{1}{3}$
 $= \frac{19}{20}$

- 5 (a) P(menang dalam semua perlawanan)
 $= \frac{3}{5} \times \frac{1}{4} \times \frac{5}{6} \times \frac{1}{8} = \frac{1}{64}$
(b) P(menang sekurang-kurangnya dua perlawanan)
 $= \left(\frac{3}{5} \times \frac{1}{4} \times \frac{5}{6}\right) + \left(\frac{3}{5} \times \frac{1}{4} \times \frac{1}{6}\right)$
 $+ \left(\frac{2}{5} \times \frac{1}{4} \times \frac{5}{6}\right) + \left(\frac{3}{5} \times \frac{3}{4} \times \frac{5}{6}\right)$
 $= \frac{1}{8} + \frac{1}{40} + \frac{1}{12} + \frac{3}{8}$
 $= \frac{73}{120}$



$$(a) P(MM) = \frac{5}{9} \times \frac{5}{9} = \frac{25}{81}$$

$$(b) P(MMM) = \frac{5}{9} \times \frac{5}{9} \times \frac{5}{9} = \frac{125}{729}$$

$$(c) P(BBB) + P(BBM) + P(BMB) + P(MBB)$$

$$= \left(\frac{4}{9} \times \frac{4}{9} \times \frac{4}{9} \right) + \left(\frac{4}{9} \times \frac{4}{9} \times \frac{5}{9} \right) \times 3$$

$$= \frac{304}{729}$$

$$(d) P(BBM) + P(BMB) + P(MBB)$$

$$= \left(\frac{5}{9} \times \frac{4}{9} \times \frac{4}{9} \right) \times 3 = \frac{80}{243}$$

$$7 (a) P(\text{kedua-dua kad sama warna})$$

$$= P(BB) + P(MM) + P(HH)$$

$$= \left(\frac{4}{14} \times \frac{3}{13} \right) + \left(\frac{3}{14} \times \frac{2}{13} \right) + \left(\frac{7}{14} \times \frac{6}{13} \right)$$

$$= \frac{30}{91}$$

$$(b) P(\text{kedua-dua kad berlainan warna})$$

$$= 1 - \frac{30}{91} = \frac{61}{91}$$

$$8 (a) P(BH) + P(HB) = \left(\frac{4}{15} \times \frac{5}{14} \right) \times 2 = \frac{4}{21}$$

$$(b) P(HH) + P(BB) = \left(\frac{5}{15} \times \frac{4}{14}\right) + \left(\frac{6}{15} \times \frac{5}{14}\right) = \frac{5}{21}$$

9 P(3 orang menerima pen yang berwarna sama)

$$\begin{aligned} &= P(BBB) + P(MMM) \\ &= \left(\frac{7}{10} \times \frac{6}{9} \times \frac{5}{8}\right) + \left(\frac{3}{10} \times \frac{2}{9} \times \frac{1}{8}\right) \\ &= \frac{7}{24} + \frac{1}{120} \\ &= \frac{3}{10} \end{aligned}$$

$$10 (a) P(MM) = \frac{1}{6} \times \frac{4}{6} = \frac{1}{9}$$

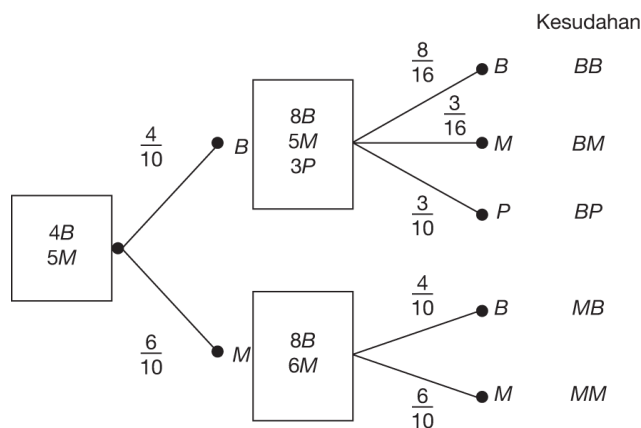
$$(b) P(MK) + P(KM) = \left(\frac{1}{6} \times \frac{1}{6}\right) + \left(\frac{3}{6} \times \frac{4}{6}\right) = \frac{13}{36}$$

$$\begin{aligned} (c) P(\text{berlainan warna}) &= 1 - P(\text{sama warna}) \\ &= 1 - \left(\frac{1}{6} \times \frac{4}{6}\right) - \left(\frac{2}{6} \times \frac{1}{6}\right) - \left(\frac{3}{6} \times \frac{1}{6}\right) \\ &= \frac{3}{4} \end{aligned}$$

$$11 (a) P(HH) = \frac{2}{9} \times \frac{8}{14} = \frac{8}{63}$$

$$(b) P(KB) + P(BK) = \frac{3}{9} \times \frac{4}{14} + \frac{4}{9} \times \frac{2}{14} = \frac{10}{63}$$

12



$$(a) P(MB) + P(BM) = \frac{6}{10} \times \frac{4}{10} + \frac{4}{10} \times \frac{5}{16} = \frac{73}{200}$$

$$(b) P(BP) = \frac{4}{10} \times \frac{3}{16} = \frac{3}{40}$$

Praktis Formatif 9.3

- 1 (a) Peristiwa saling eksklusif
(b) peristiwa tidak saling eksklusif

2 (a) (i) $P(A) = \frac{4}{10} = \frac{2}{5}$

(ii) $P(B) = \frac{3}{10}$

(b) Ya. A dan B ialah peristiwa saling eksklusif.

(c) $P(A \cup B) = \frac{2}{5} + \frac{3}{10} = \frac{7}{10}$

3 (a) Ya, A dan B ialah peristiwa saling eksklusif.

(b) $P(A \cup B) = \frac{4}{6} + \frac{2}{6} = 1$

4

$A \backslash B$	1	2	3	4	5
1	√			×	
2		√	×		
3		×	√		
4	×			√	
5					√

Tandakan √ untuk peristiwa kedua-dua kad mempunyai nombor yang sama.
Tandakan × untuk peristiwa hasil tambah nombor kedua-dua kad ialah 5.

(a) $P(\text{kedua-dua kad mempunyai nombor yang sama}) = \frac{5}{25} = \frac{1}{5}$

(b) $P(\text{hasil tambah kedua-dua kad 5}) = \frac{4}{25}$

(c) $P(A \cup B) = \frac{1}{5} + \frac{4}{25} = \frac{9}{25}$

5 $(X \cup Y) = P(X) + P(Y) - P(X \cap Y)$

$$= \frac{3}{10} + \frac{2}{5} - \left(\frac{3}{10} \times \frac{2}{5} \right)$$

$$= \frac{29}{50}$$

6 (a) Ya, kedua-dua peristiwa adalah saling eksklusif.

(b) (i) $P(T \cup B) = \frac{2}{9} + \frac{4}{9} = \frac{2}{3}$

(ii) $P(T' \cap B') = P(T \cup B)' = 1 - \frac{2}{3} = \frac{1}{3}$

7 (a) $P(B \cup P) = \frac{25}{60} + \frac{36}{60} - \frac{16}{60} = \frac{3}{4}$

(b) $P(C \cup Q) = \frac{35}{60} + \frac{24}{60} - \frac{15}{60} = \frac{11}{15}$

Praktis Formatif 9.4

1

$A \backslash B$	1	2	3	4
1	√		√	
2		√		√×
3	√		√×	×
4		√×	×	√×

Tandakan √ untuk peristiwa hasil tambah nombor ialah nombor genap.

Tandakan × untuk peristiwa hasil tambah nombor adalah lebih besar daripada 5.

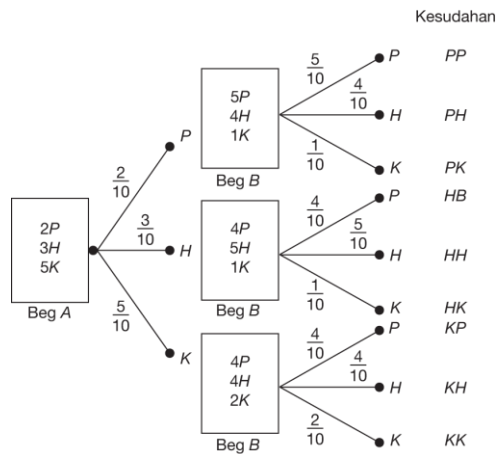
(a) $P(\text{nombor genap dan nombor yang lebih besar daripada 5})$

$$= \frac{4}{16} = \frac{1}{4}$$

(b) $P(\text{nombor genap dan nombor yang lebih besar daripada 5})$

$$= \frac{10}{16} = \frac{5}{8}$$

2



$$\begin{aligned}
 & P(PP) + P(HH) + P(KK) \\
 &= \left(\frac{2}{10} \times \frac{5}{10}\right) + \left(\frac{3}{10} \times \frac{5}{10}\right) + \left(\frac{5}{10} \times \frac{2}{10}\right) \\
 &= \frac{7}{20}
 \end{aligned}$$

3 (a) $P(\overline{A} \overline{R} \overline{Z}) + P(\overline{A} R \overline{Z}) + P(\overline{A} \overline{R} Z)$

$$\begin{aligned}
 &= \left(\frac{9}{10} \times \frac{1}{5} \times \frac{3}{10}\right) + \left(\frac{1}{10} \times \frac{4}{5} \times \frac{3}{10}\right) \\
 &\quad + \left(\frac{1}{10} \times \frac{1}{5} \times \frac{7}{10}\right) \\
 &= \frac{23}{150}
 \end{aligned}$$

$$\begin{aligned}
 \text{(b) } P(A R \bar{Z}) + P(A \bar{R} Z) + P(\bar{A} R Z) \\
 &= \left(\frac{9}{10} \times \frac{4}{5} \times \frac{3}{10}\right) + \left(\frac{9}{10} \times \frac{1}{5} \times \frac{7}{10}\right) \\
 &\quad + \frac{1}{10} \times \frac{4}{5} \times \frac{7}{10} \\
 &= \frac{199}{500}
 \end{aligned}$$

(c) P(sekurang-kurangnya satu orang mengenai sasaran)

$$\begin{aligned}
 &= 1 - \frac{1}{10} \times \frac{1}{5} \times \frac{3}{10} \\
 &= \frac{497}{500}
 \end{aligned}$$

4 P(MH) + P(HM)

$$\begin{aligned}
 &= \left(\frac{6}{10} \times \frac{4}{10}\right) + \frac{4}{10} \times \frac{6}{9} \\
 &= \frac{38}{75}
 \end{aligned}$$

5 (a) P(kedua-duanya buku SPM)

$$\begin{aligned}
 &= \frac{5}{8} \times \frac{4}{7} \\
 &= \frac{5}{14}
 \end{aligned}$$

(b) P(kedua-duanya subjek yang sama)

$$\begin{aligned}
 &= \left(\frac{6}{18} \times \frac{5}{17}\right) + \left(\frac{7}{18} \times \frac{6}{17}\right) + \left(\frac{5}{18} \times \frac{4}{17}\right) \\
 &= \frac{46}{153}
 \end{aligned}$$

6 (a) P(kedua-duanya lelaki)

$$\begin{aligned}
 &= \frac{5}{12} \times \frac{4}{11} \\
 &= \frac{5}{33}
 \end{aligned}$$

(b) P(kedua-duanya dari negara yang sama)

$$\begin{aligned}
 &= \left(\frac{7}{16} \times \frac{6}{15}\right) + \left(\frac{4}{16} \times \frac{3}{15}\right) + \left(\frac{5}{16} \times \frac{4}{15}\right) \\
 &= \frac{37}{150}
 \end{aligned}$$

Praktis Sumatif 9**Soalan Objektif****1**

A \ B	1	3	5
1			
2	×	×	√×
3			
4	×	√×	×
5			

Tandakan √ untuk peristiwa hasil tambah nombor ialah 7.

Tandakan × untuk peristiwa hasil tambah nombor adalah lebih besar daripada 5.

P(hasil tambah nombor-nombor ialah 7 atau hasil darab nombor-nombor itu adalah genap)

$$= \frac{6}{15} = \frac{2}{5}$$

Jawapan: C

2 P(Gandaan 3 atau kuasa dua sempurna)

$$= \frac{3}{9} + \frac{2}{9} - \frac{1}{9} = \frac{4}{9}$$

Jawapan: B

3 P(dua orang lulus)

$$= \left(\frac{1}{3} \times \frac{2}{5} \times \frac{1}{4}\right) + \left(\frac{2}{3} \times \frac{2}{5} \times \frac{3}{4}\right) + \left(\frac{1}{3} \times \frac{3}{4} \times \frac{3}{5}\right)$$

$$= \frac{1}{30} + \frac{1}{5} + \frac{3}{20}$$

$$= \frac{23}{60}$$

Jawapan: D

4 P(warna sama)

$$= \left(\frac{5}{11} \times \frac{6}{10}\right) + \left(\frac{6}{10} \times \frac{5}{11}\right)$$

$$= \frac{6}{11}$$

Jawapan: C

5 P(RG) + P(GR)

$$= \left(\frac{4}{8} \times \frac{4}{8}\right) + \left(\frac{4}{8} \times \frac{4}{7}\right)$$

$$= \frac{15}{18}$$

Jawapan: B

Soalan Struktur**1 (a) P(FFF)**

$$\begin{aligned} &= \frac{8}{9} \times \frac{23}{25} \times \frac{19}{20} \\ &= \frac{874}{1125} \end{aligned}$$

(b) P(seorang sahaja lulus)

$$\begin{aligned} &= \left(\frac{1}{9} \times \frac{23}{25} \times \frac{19}{20} \right) + \left(\frac{8}{9} \times \frac{2}{25} \times \frac{19}{20} \right) + \\ &\quad \left(\frac{1}{20} \times \frac{8}{9} \times \frac{23}{25} \right) \\ &= \frac{437}{4500} + \frac{76}{1125} + \frac{46}{1125} \\ &= \frac{37}{180} \end{aligned}$$

(c) P(sekurang-kurangnya seorang lulus)

$$\begin{aligned} &= 1 - \text{P(semua gagal)} \\ &= 1 - \frac{8}{9} \times \frac{23}{25} \times \frac{19}{20} \\ &= 1 - \frac{874}{1125} \\ &= \frac{251}{1125} \end{aligned}$$

2 (a) P(Fizik, Kimia)

$$\begin{aligned} &= \frac{3}{14} \times \frac{5}{13} \\ &= \frac{15}{182} \end{aligned}$$

(b) P(kategori sama)

$$\begin{aligned} &= \left(\frac{3}{14} \times \frac{2}{13} \right) + \left(\frac{5}{14} \times \frac{4}{13} \right) + \left(\frac{6}{14} \times \frac{5}{13} \right) \\ &= \frac{4}{13} \end{aligned}$$

3 (a) Ya, T dan S ialah peristiwa saling eksklusif.**(b) (i) P(bermain tennis atau skuasy)**

$$\begin{aligned} &= \frac{4}{7} + \frac{2}{7} \\ &= \frac{6}{7} \end{aligned}$$

(ii) P(tidak bermain tenis atau skuasy)

$$\begin{aligned} &= 1 - \frac{6}{7} \\ &= \frac{1}{7} \end{aligned}$$

4

	<i>B</i>	1	2	3
<i>A</i>		1	2	3
1	√		×	
2		√×	√×	
3	×		√	

Tandakan √ untuk peristiwa kedua-dua kad adalah sama.

Tandakan × untuk peristiwa hasil tambah nombor adalah ialah 4.

(a) P(kedua-dua kad adalah sama)

$$= \frac{3}{9} = \frac{1}{3}$$

(b) P(hasil tambah nombor adalah ialah 4)

$$= \frac{3}{9} = \frac{1}{3}$$

(c) P(kedua-dua kad adalah sama atau hasil tambah nombor adalah ialah 4)

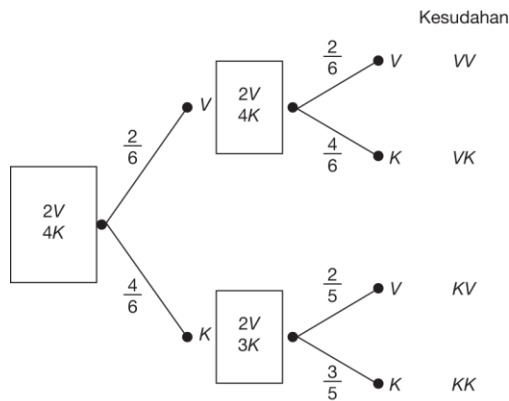
$$= \frac{3}{9} + \frac{3}{9} - \frac{1}{9} = \frac{5}{9}$$

5 (a) P(VV) + P(KK)

$$= \left(\frac{4}{10} \times \frac{3}{9}\right) + \left(\frac{6}{10} \times \frac{5}{9}\right)$$

$$= \frac{7}{15}$$

6



(a) $P(KK) = \frac{4}{6} \times \frac{3}{5} = \frac{2}{5}$

(b) $P(VK) + P(KV) = \frac{2}{6} \times \frac{4}{6} + \frac{4}{6} \times \frac{2}{5} = \frac{22}{45}$

7 (a) $P(AA) = \frac{3}{8} \times \frac{2}{9} = \frac{1}{12}$

(b) $P(A\bar{A}) + P(\bar{A}A) = \left(\frac{3}{8} \times \frac{7}{9}\right) + \left|\frac{5}{8} \times \frac{1}{9}\right| = \frac{13}{36}$

$$8 \text{ (a) } P(20, 20) + P(20, 20) = \frac{2}{10} \times \frac{3}{12} = \frac{1}{20}$$

$$\text{(b) } P(20, 50) + P(50, 20) = \frac{2}{10} \times \frac{4}{12} + \frac{5}{10} \times \frac{3}{12} = \frac{23}{120}$$

$$9 \text{ (a) } P(PP) = \frac{6}{11} \times \frac{5}{10} = \frac{3}{11}$$

$$\text{(b) } P(LL) + P(PP) = \frac{5}{9} \times \frac{4}{8} + \frac{4}{9} \times \frac{3}{8} = \frac{4}{9}$$

$$10 \quad S = \{(2, A), (2, B), (4, A), (4, B), (7, A), (7, B), (9, A), (9, B)\}$$

$$\text{(a) } P\{(2, A), P(4, A)\},$$

$$P(\text{nomber genap dan huruf } A) = \frac{2}{8} = \frac{1}{4}$$

$$\text{(b) } P\{(2, A), (2, B), (7, A), (7, B), (4, B), (9, B)\}$$

$$P(\text{nombor perdana atau huruf } B) = \frac{6}{8} = \frac{3}{4}$$

$$11 \text{ (a) } P(\text{putih, bola biru}) = \frac{120}{360} \times \frac{2}{6} = \frac{1}{9}$$

$$\text{(b) } P(\text{ungu, kad merah}) + P(\text{putih, bola merah})$$

$$= \frac{240}{360} \times \frac{6}{14} + \frac{120}{360} \times \frac{4}{6}$$

$$= \frac{32}{63}$$

$$12 \quad P(\text{warna yang sama})$$

$$= \left(\frac{4}{15} \times \frac{3}{14} \times \frac{2}{13}\right) + \left(\frac{5}{15} \times \frac{4}{14} \times \frac{3}{13}\right) + \left(\frac{6}{15} \times \frac{5}{14} \times \frac{4}{13}\right)$$

$$= \frac{4}{455} + \frac{2}{91} + \frac{4}{91}$$

$$= \frac{34}{455}$$

$$13 \text{ (a) } P(\text{mengeuai sasaran 1 kali})$$

$$= \left(\frac{4}{5} \times \frac{1}{5} \times \frac{1}{5}\right) \times 3$$

$$= \frac{12}{125}$$

$$\text{(b) } P(\text{mengeuai sasaran 2 kali})$$

$$= \left(\frac{4}{5} \times \frac{4}{5} \times \frac{1}{5}\right) \times 3$$

$$= \frac{48}{125}$$

$$\begin{aligned}
& \text{(c) P(mengenai sasaran sekurang-kurangnya 1 kali)} \\
&= 1 - \text{P(tidak mengenai sasaran)} \\
&= 1 - \left(\frac{1}{5} \times \frac{1}{5} \times \frac{1}{5}\right) \\
&= \frac{124}{125}
\end{aligned}$$

$$\begin{aligned}
& \text{(d) P(mengenai sasaran sekurang-kurangnya 2 kali)} \\
&= \frac{48}{125} + \left(\frac{4}{5} \times \frac{4}{5} \times \frac{4}{5}\right) \\
&= \frac{48}{125} + \frac{64}{125} \\
&= \frac{112}{125}
\end{aligned}$$

14 P(Dua huruf yang sama dipilih)

$$\begin{aligned}
&= \left(\frac{2}{9} \times \frac{1}{8}\right) + \left(\frac{2}{9} \times \frac{1}{8}\right) + \left(\frac{2}{9} \times \frac{1}{8}\right) \\
&= \frac{1}{12}
\end{aligned}$$