

# Penyelesaian Lengkap

## Praktis 9

### Praktis Formatif

#### 9.1 Peristiwa Bergabung

##### Combined Events

- 1 (a)  $\{(I, K), (A, K), (I, T), (A, T)\}$   
 $n(S) = (2) \times (2) = (4)$
- (b)  $\{(H, T), (H, H), (T, T), (T, H)\}$   
 $n(S) = (2) \times (2) = (4)$
- (c)  $\{(J, U), (J, N), (U, J), (U, N), (N, J), (N, U)\}$   
 $n(S) = (3) \times (2) = (6)$

#### 9.2 Peristiwa Bersandar dan Peristiwa Tidak Bersandar

##### Dependent Events and Independent Events

- 1 (a) Peristiwa tak bersandar kerana kebarangkalian mendapat nombor 6 bagi dadu pertama tidak mempengaruhi kebarangkalian mendapat nombor 6 bagi dadu kedua.  
*Independent event because the probability of getting a 6 in the first dice does not affect the probability of getting a 6 in the second dice.*
- (b) Peristiwa tak bersandar kerana kebarangkalian hujan lebat pada hari Isnin tidak mempengaruhi kebarangkalian hujan lebat pada hari Selasa.  
*Independent event because the probability of raining heavily on Monday does not affect the probability of raining heavily on Tuesday.*
- (c) Peristiwa tak bersandar kerana kebarangkalian memilih satu perempuan tidak mempengaruhi kebarangkalian memilih satu lelaki.  
*Independent event because the probability of choosing a girl does not affect the probability of choosing a boy.*
- (d) Peristiwa bersandar kerana kebarangkalian mendapat nombor ganjil pada kali pertama mempengaruhi kebarangkalian dadu tersebut dilambung pada kali kedua.  
*Dependent event because the probability of getting odd number in the first time affects the probability of tossing the dice for the second time.*

#### 2 Hukumendaraban

$$P(\text{Rina akan menghadiri majlis}) = \frac{1}{2}$$

$$P(\text{memilih gaun berwarna cerah}) = \frac{3}{5}$$

$P(\text{Rina menghadiri majlis memakai gaun berwarna cerah})$

$$= \frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$$

Menyenaraikan semua kesudahan yang mungkin.

Kesudahan yang mungkin =  $\{(H, O), (H, K), (H, M)\}$

$$n(S) = 2 \times 5 = 10$$

$$P(\text{Rina menghadiri majlis memakai gaun berwarna cerah}) = \frac{3}{10}$$

Maka, terbuktilah bahawa kedua-dua kaedah menghasilkan jawapan yang sama.

Multiplication rule

$$P(\text{Rina will attend the function}) = \frac{1}{2}$$

$$P(\text{choose a bright coloured gown}) = \frac{3}{5}$$

$P(\text{Rina attended the function with a bright coloured gown})$

$$= \frac{1}{2} \times \frac{3}{5} = \frac{3}{10}$$

List all the possible outcomes.

Possible outcomes =  $\{(H, O), (H, Y), (H, R)\}$

$$n(S) = 2 \times 5 = 10$$

$$P(\text{Rina attended the function with a bright coloured gown}) = \frac{3}{10}$$

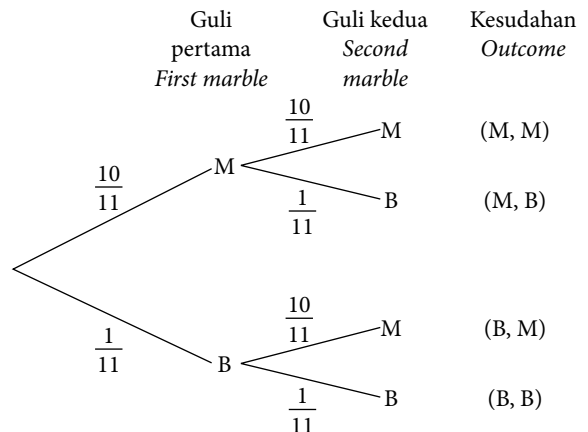
Therefore, it is shown that both methods give the same answer.

- 3 (a)  $\{(S, 1), (S, 2), (S, 3), (A, 1), (A, 2), (A, 3), (T, 1), (T, 2), (T, 3), (U, 1), (U, 2), (U, 3)\}$

$$(b) P(S, \text{nombor perdana/prime number}) = \left(\frac{1}{4} \times \frac{2}{3}\right) = \frac{1}{6}$$

$$4 P(R, R') = (1 - 0.67)(0.67) = 0.2211$$

5 (a)

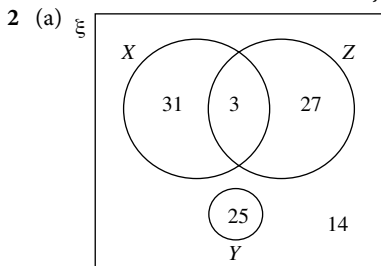


$$(b) (i) P(M, M) = \left(\frac{10}{11} \times \frac{10}{11}\right) = \frac{100}{121}$$

$$(ii) P(B, B) = \left(\frac{1}{11} \times \frac{1}{11}\right) = \frac{1}{121}$$

**9.3 Peristiwa Saling Eksklusif dan Peristiwa Tidak Saling Eksklusif**  
**Mutually Exclusive Events and Non-Mutually Exclusive Events**

- 1 (a) Peristiwa  $P$  dan  $Q$  boleh berlaku bersama, maka  $P$  dan  $Q$  ialah peristiwa tidak saling eksklusif.  
*Event  $P$  and event  $Q$  can occur together. Therefore, event  $P$  and event  $Q$  are non-mutually exclusive.*
- (b) Peristiwa  $Q$  dan  $R$  tidak boleh berlaku bersama, maka  $Q$  dan  $R$  ialah peristiwa saling eksklusif.  
*Event  $Q$  and event  $R$  cannot occur together. Therefore, event  $Q$  and event  $R$  are mutually exclusive.*
- (c) Peristiwa  $P$  dan  $R$  tidak boleh berlaku bersama, maka  $P$  dan  $R$  ialah peristiwa saling eksklusif.  
*Event  $P$  and event  $R$  cannot occur together. Therefore, event  $P$  and event  $R$  are mutually exclusive.*



(b) (i) 
$$P(X \cup Y) = \frac{31 + 3 + 25}{100}$$

$$= \frac{59}{100}$$

$$P(X) + P(Y)$$

$$= \frac{34}{100} + \frac{25}{100}$$

$$= \frac{59}{100}$$

Maka, terbukti/ Hence, it is proven that  $P(X \cup Y) = P(X) + P(Y)$ .

(ii) 
$$P(Y \cup Z) = \frac{n(Y \cup Z)}{n(S)}$$

$$= \frac{3 + 27 + 25}{100}$$

$$= \frac{55}{100}$$

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

$$P(Y) + P(Z) = \frac{25}{100} + \frac{30}{100}$$

$$= \frac{55}{100}$$

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

Maka, terbukti/ Hence, it is proven that  $P(Y \cup Z) = P(Y) + P(Z)$ .

(iii) 
$$P(X \cup Z) = \frac{n(X \cup Z)}{n(S)}$$

$$= \frac{31 + 3 + 27}{100}$$

$$= \frac{61}{100}$$

$$P(X) + P(Z) - P(X \cap Z) = \frac{34}{100} + \frac{30}{100} - \frac{3}{100}$$

$$= \frac{61}{100}$$

Maka, terbukti/ Hence, it is proven that  $P(X \cup Z) = P(X) + P(Z) - P(X \cap Z)$ .

- 3 (a) Peristiwa  $H$  dan  $I$  boleh berlaku bersama, maka  $H$  dan  $I$  ialah peristiwa tidak saling eksklusif.  
*Event  $H$  and event  $I$  can occur together. Therefore, event  $H$  and event  $I$  are non-mutually exclusive.*
- (b) Peristiwa  $I$  dan  $J$  tidak boleh berlaku bersama, maka  $I$  dan  $J$  ialah peristiwa saling eksklusif.  
*Event  $I$  and event  $J$  cannot occur together. Therefore, event  $I$  and event  $J$  are mutually exclusive.*
- (c) Peristiwa  $H$  dan  $J$  tidak boleh berlaku bersama, maka  $H$  dan  $J$  ialah peristiwa saling eksklusif.  
*Event  $H$  and event  $J$  cannot occur together. Therefore, event  $H$  and event  $J$  are mutually exclusive.*
- 4 
$$P\left(\begin{array}{l} \text{sekurang-kurangnya seorang daripada mereka} \\ \text{membeli rumah sebelum usia 30 tahun} \\ \text{at least one of them buy their first home before} \\ \text{the age of 30} \end{array}\right)$$

$$= P(M, F) + P(M', F) + P(M, F')$$

$$= \left(\frac{1}{3} \times \frac{4}{9}\right) + \left(\frac{2}{3} \times \frac{4}{9}\right) + \left(\frac{1}{3} \times \frac{5}{9}\right)$$

$$= \frac{17}{27}$$
- 5  $P(\text{permohonan kad kredit kedua-dua-dua orang pemuda tersebut diluluskan})$   
 *$P(\text{credit card application of two youths get approved})$* 

$$= \frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$$
- 6  $P(\text{sekurang-kurangnya seorang pekerja tidak mendapat tempahan dalam tempoh masa 1 minit})$   
 *$P(\text{at least one of the workers do not have any order within a period of one minute})$* 

$$= 1 - P(W, W)$$

$$= 1 - \left(\frac{2}{11} \times \frac{2}{11}\right)$$

$$= \frac{117}{121}$$
- 7  $P(\text{Wendy dan Billy tidak menyertai persatuan catur})$   
 *$P(\text{both Wendy and Billy are not joining chess club})$* 

$$= P(W', B')$$

$$= \frac{16}{19} \times \frac{19}{21}$$

$$= \frac{16}{21}$$

### 9.4 Aplikasi Kebarangkalian Peristiwa Bergabung Application of Probability of Combined Events

- 1  $P(\text{Hasil darab dua nombor ialah nombor genap})$   
 $P(\text{product of two numbers is an even number})$   
 $= P(\text{genap, ganjil}) + P(\text{genap, genap}) + P(\text{ganjil, genap})$   
 $P(\text{even, odd}) + P(\text{even, even}) + P(\text{odd, even})$   
 $= \left(\frac{1}{2} \times \frac{1}{2}\right) + \left(\frac{1}{2} \times \frac{1}{2}\right) + \left(\frac{1}{2} \times \frac{1}{2}\right)$   
 $= \frac{3}{4}$   
 $n(\text{sekurang-kurangnya sekali hasil darab dua nombor}$   
 $\text{ialah nombor genap})$   
 $n(\text{at least one product of two numbers is an even}$   
 $\text{number})$   
 $= \frac{3}{4} \times 280$   
 $= 210 \text{ kali/times}$
- 2  $P(H, H, H) + P(T, T, T)$   
 $= \left(\frac{2}{3} \times \frac{2}{3} \times \frac{2}{3}\right) + \left(\frac{1}{3} \times \frac{1}{3} \times \frac{1}{3}\right)$   
 $= \frac{1}{3}$

- 3 Sebuah hadiah boleh ditebus dengan setiap 5 mata yang dikumpul.  
*A gift is redeemable with every 5 points accumulated.*  
 $n(S) = 66$   
 Terdapat 25 kesudahan bagi kes mendapat kurang daripada 2 hadiah.  
*There are 25 outcomes for the case of getting less than 2 gifts.*  
 Kebarangkalian menebus sekurang-kurangnya dua hadiah  
*The probability of redeem at least two gifts*  
 $= 1 - \text{kebarangkalian menebus kurang daripada dua hadiah/probability of redeem less than 2 gifts}$   
 $= 1 - \text{kebarangkalian menebus satu hadiah/the probability of redeem 1 gift} - \text{kebarangkalian tidak menebus hadiah/the probability of redeem 0 gift}$   
 $= 1 - P(1 \text{ hadiah/gift}) - P(0 \text{ hadiah/gift})$   
 $= 1 - \frac{25}{66}$   
 $= \frac{41}{66}$

BILANGAN HADIAH NUMBER OF GIFTS	MARKAH MARKS	ROLL LAMBUNG 1	ROLL LAMBUNG 2	ROLL LAMBUNG 3	KESUDAHAN OUTCOME	
0	1	1			1	
	3	3			3	
		2		1		(2, 1)
1	5	5			5	
		4	1		(4, 1)	
		2	3		(2, 3)	
		2	2	1	(2, 2, 1)	
		6	2	2	2	(2, 2, 2)
	7	6	1			(6, 1)
		4	3			(4, 3)
		4	2	1		(4, 2, 1)
		2	5			(2, 5)
		2	4	1		(2, 4, 1)
	8	2	2	3		(2, 2, 3)
		2	2	4		(2, 2, 4)
		4	4	2		(2, 4, 2)
9	4	2	2	2	(4, 2, 2)	
	6	3			(6, 3)	
	6	2	1		(6, 2, 1)	
		4	5		(4, 5)	

BILANGAN HADIAH NUMBER OF GIFTS	MARKAH MARKS	ROLL LAMBUNG 1	ROLL LAMBUNG 2	ROLL LAMBUNG 3	KESUDAHAN OUTCOME
		4	4	1	(4, 4, 1)
		4	2	3	(4, 2, 3)
		2	6	1	(2, 6, 1)
		2	4	3	(2, 4, 3)
		2	2	5	(2, 2, 5)
2	10	2	2	6	(2, 2, 6)
		2	6	2	(2, 6, 2)
		6	2	2	(6, 2, 2)
		4	2	4	(4, 2, 4)
		4	4	2	(4, 4, 2)
		2	4	4	(2, 4, 4)
	11	6	5		(6, 5)
		6	4	1	(6, 4, 1)
		6	2	3	(6, 2, 3)
		4	6	1	(4, 6, 1)
		4	4	3	(4, 4, 3)
		4	2	5	(4, 2, 5)
		2	6	3	(2, 6, 3)
		2	4	5	(2, 4, 5)
	12	6	4	2	(6, 4, 2)
		6	2	4	(6, 2, 4)
		2	4	6	(2, 4, 6)
		4	2	6	(4, 2, 6)
		2	6	4	(2, 6, 4)
		4	6	2	(4, 6, 2)
		4	4	4	(4, 4, 4)
	13	6	6	1	(6, 6, 1)
		6	4	3	(6, 4, 3)
		6	2	5	(6, 2, 5)
		4	6	3	(4, 6, 3)
		4	4	5	(4, 4, 5)
		2	6	5	(2, 6, 5)
	14	6	6	2	(6, 6, 2)
		6	2	6	(6, 2, 6)
		2	6	6	(2, 6, 6)
		4	6	4	(4, 6, 4)
		4	4	6	(4, 4, 6)
		6	4	4	(6, 4, 4)

BILANGAN HADIAH NUMBER OF GIFTS	MARKAH MARKS	ROLL LAMBUNG 1	ROLL LAMBUNG 2	ROLL LAMBUNG 3	KESUDAHAN OUTCOME
3	15	6	6	3	(6, 6, 3)
		6	4	5	(6, 4, 5)
		4	6	5	(4, 6, 5)
	16	6	4	6	(6, 4, 6)
		6	6	4	(6, 6, 4)
		4	6	6	(4, 6, 6)
	17	6	6	5	(6, 6, 5)
	18	6	6	6	(6, 6, 6)

- 4 (a) Terdapat 5 huruf vokal dalam kotak P, iaitu, {A, E, I, O, U}.

Jadi, kebarangkalian mendapat huruf vokal ialah  $\frac{5}{26}$ .

Oleh itu, kebarangkalian untuk memilih sekeping kad dari kotak Q sebanyak 100 kali berturut-turut ialah  $\left(\frac{5}{26}\right)^{100}$ .

There are 5 vowels in Box P, i.e. {A, E, I, O, U}.

So, the probability of getting a vowel is  $\frac{5}{26}$ .

Therefore, the probability to choose a card from box Q for 100 times continuously is  $\left(\frac{5}{26}\right)^{100}$ .

- (b) Nombor kuasa dua sempurna dalam kotak Q ialah {1, 4, 9, 16, 25, 36, 49, 64, 81, 100}.

Kebarangkalian mendapat nombor kuasa dua sempurna dari kotak Q ialah  $\frac{10}{100} = \frac{1}{10}$ .

Kebarangkalian mendapat nombor bukan kuasa dua sempurna dari kotak Q ialah  $\frac{90}{100} = \frac{9}{10}$ .

Kebarangkalian mendapat sekurang-kurangnya satu nombor kuasa dua sempurna daripada 5 kali = 1 - Kebarangkalian tidak mendapat nombor kuasa dua sempurna sebanyak 5 kali

$$= 1 - \left(\frac{9}{10}\right)^5$$

$$= 0.4095$$

The perfect square numbers in box Q are {1, 4, 9, 16, 25, 36, 49, 64, 81, 100}.

The probability of getting a perfect square from box Q is  $\frac{10}{100} = \frac{1}{10}$ .

The probability of getting a non perfect square from box Q is  $\frac{90}{100} = \frac{9}{10}$ .

The probability of getting at least a perfect square number out of 5 times

= 1 - The probability of not getting a perfect square for 5 times

$$= 1 - \left(\frac{9}{10}\right)^5$$

$$= 0.4095$$

### Praktis Sumatif

#### Kertas 1

1 B      2 D      3 C      4 B      5 B  
6 A

#### Kertas 2

#### Bahagian/Section A

- 1 (a) A = {21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39}

Nombor dengan beza digit lebih daripada 5

The number with difference in digits more than 5 = {28, 29, 39}

Nombor gandaan 2/Multiples of 2

= {22, 24, 26, 28, 30, 32, 34, 36, 38}

P(Nombor dengan beza digit lebih daripada 5 atau nombor gandaan 2)

P(The number with difference in digits more than 5 or a multiple of 2)

$$= \frac{3}{19} + \frac{9}{19} - \frac{1}{19}$$

$$= \frac{11}{19}$$

- (b) A = {21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39}

Nombor kurang daripada 31

Number less than 31

= {21, 22, 23, 24, 25, 26, 27, 28, 29, 30}

Nombor faktor bagi 100/Factors of 100 = {25}

$$P(\text{Nombor kurang daripada 31 atau faktor bagi 100})$$

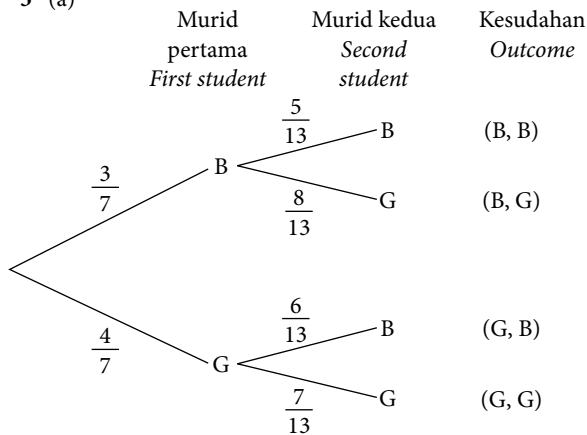
$$P(\text{Number less than 31 or factors of 100})$$

$$= \frac{10}{19}$$

### Bahagian/Section B

- 2 (a)  $P(\text{hasil daripada sekurang-kurangnya satu pokok tersebut dikutip/collecting fruits from any of the two trees})$   
 $= P(P, R) + P(P', R) + P(P, R')$   
 $= (0.26)(0.39) + (1 - 0.26)(0.39) + (0.26)(1 - 0.39)$   
 $= 0.5486$
- (b)  $P(\text{hasil daripada kedua-dua pokok tersebut dikutip/collecting fruits from both trees})$   
 $= (0.26)(0.39) = 0.1014$
- (c)  $P(\text{tidak mempunyai hasil daripada kedua-dua pokok/no collection from both trees})$   
 $= (1 - 0.26)(1 - 0.39) = 0.4514$

3 (a)



- (b)  $P(\text{sekurang-kurangnya seorang perempuan})$   
 $P(\text{at least one girl})$   
 $= 1 - P(B, B)$   
 $= 1 - \left(\frac{3}{7}\right)\left(\frac{5}{13}\right)$   
 $= \frac{76}{91}$

4 (a)

Kotak X <i>Box X</i>	Kotak Y <i>Box Y</i>		
	1	2	3
A	(A, 1)	(A, 2)	(A, 3)
B	(B, 1)	(B, 2)	(B, 3)
C	(C, 1)	(C, 2)	(C, 3)
D	(D, 1)	(D, 2)	(D, 3)
E	(E, 1)	(E, 2)	(E, 3)

- (b) (i) Kesudahan mungkin/*Possible outcomes*  
 $= \{(A, 1), (A, 2), (A, 3), (B, 1), (C, 1), (D, 1), (E, 1)\}$   
 $P(\text{Murid itu menjadi ketua kumpulan atau menjadi ahli kumpulan A})$   
 $P(\text{the student is a group leader or a member of group A})$   
 $= \frac{5}{15} + \frac{3}{15} - \frac{1}{15} = \frac{7}{15}$
- (ii) Kesudahan mungkin/*Possible outcomes*  
 $= \{(A, 2), (A, 3), (B, 2), (B, 3), (C, 2), (C, 3), (D, 2), (D, 3)\}$   
 $P(\text{murid itu menyertai kumpulan selain kumpulan E dan tidak menjadi ketua kumpulan})$   
 $P(\text{the student is not from group E and not a group leader})$   
 $= \frac{8}{15}$