

Fully-worked Solutions

Practice 13

Formative Practice

1 Experimental probability of drawing a card of letter E

$$= \frac{62}{120}$$

$$= \frac{31}{60}$$

Answer: C

2 (a) Number of times of getting head = 8
Experimental probability of getting head

$$= \frac{8}{20}$$

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

(b) Number of times of getting tail = 12
Experimental probability of getting tail

$$= \frac{12}{20}$$

$$= \frac{3}{5}$$

3

Colour	Red	Yellow	Green
Number of times	5	3	4

(a) Experimental probability of getting a red card

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

(b) Experimental probability of getting a yellow card

$$= \frac{3}{12}$$

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

(c) Experimental probability of getting a green card

$$= \frac{4}{12}$$

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

4 (a) (i) Experimental probability of getting an A

$$= \frac{625}{2\,500}$$

$$= 0.2500$$

(ii) Experimental probability of getting a 7

$$= \frac{620}{2\,500}$$

$$= 0.2480$$

(iii) Experimental probability of getting a W

$$= \frac{627}{2\,500}$$

$$= 0.2508$$

(iv) Experimental probability of getting a 8

$$= \frac{628}{2\,500}$$

$$= 0.2512$$

(b) Experimental probability of getting an A

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

$$= 0.25$$

Experimental probability of getting a 7

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

$$= 0.25$$

Experimental probability of getting a W

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

$$= 0.25$$

Experimental probability of getting a 8

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

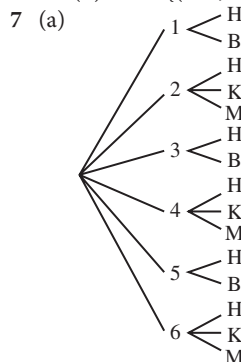
$$= 0.25$$

5 Sample space
= {(H, H), (H, M), (M, H), (M, M)}

Answer: D

6 (a) Sample space = {(Tail, Tail), (Tail, Head), (Head, Tail), (Head, Head)}

(b) (i) A = {(Tail, Head), (Head, Tail)}
(ii) B = {(Tail, Tail), (Head, Head)}



(b) Sample space
= {(1, H), (1, B), (2, H), (2, K), (2, M), (3, H), (3, B), (4, H), (4, K), (4, M), (5, H), (5, B), (6, H), (6, K), (6, M)}

(c) (i) A = {(1, B), (3, B), (5, B)}

(ii) B = {(2, K), (4, K), (6, K)}

(iii) C = {(1, H), (2, H), (3, H), (4, H), (5, H), (6, H)}

8 (a) $n(S) = 10 + 15 + 20 + 30$
 $= 75$

(i) $P(\text{a Malaysia stamp is chosen})$

$$= \frac{10}{75}$$
$$= \frac{2}{15}$$

(ii) $P(\text{a Korea stamp is chosen})$

$$= \frac{15}{75}$$
$$= \frac{1}{5}$$

(iii) $P(\text{an Australian stamp is chosen})$

$$= \frac{20}{75}$$
$$= \frac{4}{15}$$

(iv) $P(\text{a Singapore stamp is chosen})$

$$= \frac{30}{75}$$
$$= \frac{2}{5}$$

(b) (i) Experimental probability of choosing a Malaysia stamp

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

(ii) Experimental probability of choosing a Korea stamp

$$= \frac{1}{5} \quad [\checkmark]$$

(iii) Experimental probability of choosing an Australian stamp

$$= \frac{4}{15} \quad [\checkmark]$$

(iv) Experimental probability of choosing a Singapore stamp

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

9 $n(S) = 24 + 32$

$$= 56$$

(a) $P(\text{choosing a Musang King durian})$

$$= \frac{24}{56}$$
$$= \frac{3}{7}$$

(b) $P(\text{choosing a D24 durian})$

$$= \frac{32}{56}$$
$$= \frac{4}{7}$$

10

Event	Probability
Sunny	$\frac{4}{15}$
Cloudy	$\frac{1}{5}$
Stormy	$\frac{1}{6}$

Event	Probability
Rainy	$\frac{7}{30}$
Windy	$\frac{2}{15}$

11 (a) $P(\text{using 2 hours until 2.4 hours})$

$$= \frac{6}{36}$$
$$= \frac{1}{6} \quad [\checkmark]$$

(b) $P(\text{using less than 2 hours})$

$$= \frac{5+8}{36}$$
$$= \frac{13}{36} \quad [\times]$$

(c) $P(\text{using at least 2.5 hours})$

$$= \frac{10+7}{36}$$
$$= \frac{17}{36} \quad [\checkmark]$$

12 $S = \{1, 2, 3, 4, 5, 6\}$

$M = \{2, 3, 5\}$

$M' = \{1, 4, 6\}$

Answer: C

13 $A' = \{A, B, D, I, O, R, U\}$

$B' = \{B, D, G, K, N, R\}$

$C' = \{A, B, G, N, U\}$

14 (a) $P(\text{Jamal is not buying a pair of blue colour slippers})$

$$= 1 - \frac{5}{7}$$
$$= \frac{2}{7}$$

(b) $P(\text{Asmah is not winning a prize in a lucky draw})$

$$= \boxed{1} - \frac{4}{23}$$
$$= \boxed{\frac{19}{23}}$$

(c) $P(\text{Ramy does not receive a bonus payment of 2-months salary for this year})$

$$= 1 - \boxed{0.384}$$
$$= \boxed{0.616}$$

(d) $P(\text{Wai Meng did not score an A in Mathematics in the final year examination})$

$$= 1 - \boxed{0.9025}$$
$$= \boxed{0.0975}$$

	Male	Female	Total
Wearing spectacles	2	4	6
Not wearing spectacles	14	16	30
Total	16	20	36

(a) $P(\text{a male student is not wearing spectacles})$

$$= \frac{14}{36}$$

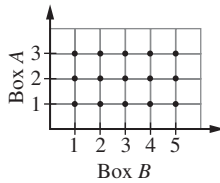
$$= \frac{7}{18}$$

(b) $P(\text{a student is not wearing spectacles})$

$$= \frac{30}{36}$$

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

16 (a)



(b) $S = \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (4, 1), (4, 2), (4, 3), (5, 1), (5, 2), (5, 3)\}$

$$n(S) = 15$$

(i) $A = \text{Event of getting two different numbers}$
 $= \{(1, 2), (1, 3), (2, 1), (2, 3), (3, 1), (3, 2), (4, 1), (4, 2), (4, 3), (5, 1), (5, 2), (5, 3)\}$

$$n(A) = 12$$

$$P(A) = \frac{12}{15} = \frac{4}{5}$$

(ii) $B = \text{Event of getting the sum of two numbers is not 7}$

$$= \{(1, 1), (1, 2), (1, 3), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (4, 1), (4, 2), (5, 1), (5, 3)\}$$

$$n(B) = 13$$

$$P(B) = \frac{13}{15}$$

Alternative method

$B = \text{Event of getting the sum of two numbers is 7}$

$$= \{(4, 3), (5, 2)\}$$

$$n(B) = 2$$

$$P(B) = \frac{2}{15}$$

$$P(B') = 1 - P(B)$$

$$= 1 - \frac{2}{15}$$

$$= \frac{13}{15}$$

17 $P(\text{the worker travels to work by van})$

$$= \frac{50}{200} = \frac{1}{4}$$

Answer: C

18 (a) $S = \{(M, B), (M, A), (M, I), (M, K), (A, B), (A, A), (A, I), (A, K), (K, B), (K, A), (K, I), (K, K), (I, B), (I, A), (I, I), (I, K), (N, B), (N, A), (N, I), (N, K)\}$

$$n(S) = 20$$

(b) (i) $A = \text{Event of choosing two similar letters}$
 $= \{(A, A), (K, K), (I, I)\}$

$$n(A) = 3$$

$$P(A) = \frac{3}{20}$$

(ii) $B = \text{Event of choosing two different vowels}$
 $= \{(A, I), (I, A)\}$

$$n(B) = 2$$

$$P(B) = \frac{2}{20} = \frac{1}{10}$$

(iii) $C = \text{Event of choosing a vowel}$
 $= \{(M, A), (M, I), (A, B), (A, K), (K, A), (K, I), (I, B), (I, K), (N, A), (N, I)\}$

$$n(C) = 10$$

$$P(C) = \frac{10}{20}$$

$$= \frac{1}{2}$$

(iv) $D = \text{Event of choosing at least a vowel}$
 $= \{(M, A), (M, I), (A, B), (A, A), (A, I), (A, K), (K, A), (K, I), (I, B), (I, A), (I, I), (I, K), (N, A), (N, I)\}$

$$n(D) = 14$$

$$P(D) = \frac{14}{20}$$

$$= \frac{7}{10}$$

19 $n(S) = 30$

(a) Modal price = RM16.50

$A = \text{Event of choosing a watermelon with the modal price}$

$$n(A) = 3$$

$$P(A) = \frac{3}{30}$$

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

(b) Median price

$$= \frac{x_{15} + x_{16}}{2}$$

$$= \frac{16.90 + 16.90}{2}$$

$$= \text{RM}16.90$$

$B = \text{Event of choosing a watermelon with the median price}$

$$n(B) = 2$$

$$P(B) = \frac{2}{30} = \frac{1}{15}$$

(c) C = Event of choosing a watermelon with a price less than the modal price

$$n(C) = 11$$

$$P(C) = \frac{11}{30}$$

(d) D = Event of choosing a watermelon with a price between RM17 and RM19

$$n(D) = 8$$

$$P(D) = \frac{8}{30} = \frac{4}{15}$$

Summative Practice

1 $S = \{x : 12 < x < 40, x \text{ is a multiple of } 3\}$

$$S = \{15, 18, 21, 24, 27, 30, 33, 36, 39\}$$

A = Event of choosing a number with the sum of digits equal to 3

$$= \{21, 30\}$$

$$n(A) = 2$$

$$n(S) = 9$$

$$P(A) = \frac{n(A)}{n(S)} = \frac{2}{9}$$

Answer: C

2 $P(M) = \frac{n(M)}{n(S)}$

$$\frac{10}{n(S)} = \frac{5}{18}$$

$$n(S) = 10 \times \frac{18}{5} = 36$$

$$P(K') = 1 - P(K)$$

$$= 1 - \frac{n(K)}{n(S)}$$

$$= 1 - \frac{12}{36}$$

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

$$= \frac{2}{3}$$

Answer: D

3 $P(\text{Pointer will not stop in the sectors labelled } 1)$

$$= 1 - P(\text{Pointer will stop in the sectors labelled } 1)$$

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

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

$$= \frac{2}{3}$$

Answer: C

4 $P(M) = \frac{n(M)}{n(S)}$

$$\frac{n(M)}{60} = \frac{1}{5}$$

$$n(M) = \frac{1}{5} \times 60$$

$$= 12$$

$$n(S) = 60 + x$$

$$\frac{12}{60 + x} = \frac{1}{8}$$

$$60 + x = 96$$

$$x = 36$$

Number of yellow spoons that need to be added is 36.

Answer: A

5 January:

Number of units occupied by owners = 140

Number of units rented

$$= 200 - 140$$

$$= 60$$

February:

Number of units rented that were moved out = 15

Number of units re-occupied by owners = 7

Number of units that were vacant

$$= 15 - 7$$

$$= 8$$

$P(\text{the unit is not occupied})$

$$= \frac{8}{200}$$

$$= \frac{1}{25}$$

Answer: A

6 (a) Sample space

$$= \{(M, M), (M, A), (M, P), (I, M), (I, A), (I, P), (N, M), (N, A), (N, P), (D, M), (D, A), (D, P)\}$$

(b) $n(S) = 12$

(i) A = Event that Izwan and Norman choose letter M

$$= \{(M, M)\}$$

$$n(A) = 1$$

$$P(A) = \frac{n(A)}{n(S)}$$

$$= \frac{1}{12}$$

(ii) B = Event that Izwan and Norman choose a consonant

$$= \{(M, M), (M, P), (N, M), (N, P), (D, M), (D, P)\}$$

$$n(B) = 6$$

$$P(B) = \frac{n(B)}{n(S)}$$

$$= \frac{6}{12}$$

$$= \frac{1}{2}$$

(iii) C = Event that Izwan chooses a vowel and Norman chooses a consonant

$$= \{(I, M), (I, P)\}$$

$$n(C) = 2$$

$$P(C) = \frac{n(C)}{n(S)}$$

$$= \frac{2}{12}$$

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

7 (a)

		Second turn					
		+	1	5	10	15	20
First turn	1	2	6	11	16	21	
	5	6	10	15	20	25	
	10	11	15	20	25	30	
	15	16	20	25	30	35	
	20	21	25	30	35	40	

(b) (i) $A = \{(5, 5), (5, 10), (5, 15), (5, 20), (10, 5), (10, 10), (10, 15), (10, 20), (15, 5), (15, 10), (15, 15), (15, 20), (20, 5), (20, 10), (20, 15), (20, 20)\}$

(ii) $B = \{(10, 20), (15, 15), (15, 20), (20, 10), (20, 15), (20, 20)\}$

(c) $n(S) = 25$

$n(A) = 16$

$$P(A) = \frac{n(A)}{n(S)}$$

$$= \frac{16}{25}$$

$n(B) = 6$

$$P(B) = \frac{n(B)}{n(S)}$$

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

$P(B') = 1 - P(B)$

$$= 1 - \frac{6}{25}$$

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