Fully-Worked Solutions

PRACTICE 13

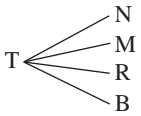
Section A

1 Ratio $= 10 : 10 + 15$
$= 10 : 25$
$= \frac{10}{5} : \frac{25}{5}$
$= 2 : 5$
Answer: **B**

2 {P, R, O, D, U, C, T, I, V, E}
Answer: **D**

3 A prime number can only be divided by 1 and itself.
Prime numbers = 53, 59, 61, 67
Answer: A

4



{(T, N), (T, M), (T, R), (T, B)}
Answer: **D**

5 All the numbers from 10 to 19 consist of 2-digit numbers.
Answer: **C**

6 S = {(J, 2), (J, 3), (J, 6), (J, 8), (U, 2), (U, 3), (U, 6), (U, 8)}
Event = {(U, 2), (U, 3)}
Answer: **A**

7 $P(G) = \frac{15}{15 + 20 + 30}$
$= \frac{15}{65}$
$= \frac{3}{13}$
Answer: **A**

8 B = {1, 4, 9, 16, 25}
$P(B) = \frac{5}{25}$
$= \frac{1}{5}$
$P(B') = 1 - P(B)$
$= 1 - \frac{1}{5}$
$= \frac{4}{5}$
Answer: **D**

9 B' = {11, 12, 14, 17, 19}
$n(S) = 10$
$P(B') = \frac{n(B')}{n(S)}$
$= \frac{5}{10}$
$= \frac{1}{2}$
Answer: **B**

10 $P(Z) = \frac{35}{35 + 20 + 45}$
$= \frac{35}{100}$
$= \frac{7}{20}$
$P(Z') = 1 - P(Z)$
$= 1 - \frac{7}{20}$
$= \frac{13}{20}$
Answer: **D**

11 A = {X, P, R, M, N, T, L}
$P(A) = \frac{7}{12}$
$P(A') = 1 - \frac{7}{12}$
$= \frac{5}{12}$
Answer: **B**

12 $P(G) = \frac{4}{9}$
$\frac{20}{20 + x} = \frac{4}{9}$
$4(20 + x) = 9 \times 20$
$20 + x = \frac{180}{4}$
$x = 45 - 20$
$x = 25$
Answer: **B**

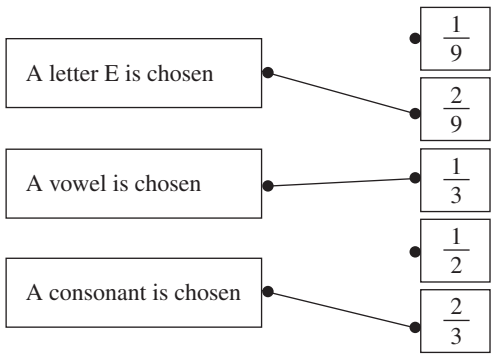
13 Number of red marbles = x
Number of blue marbles = $x + 9$
$x + x + 9 = 35$
$2x = 26$
$x = 13$
Probability $= \frac{x}{35} = \frac{13}{35}$
Answer: **C**

Section B

1 (a) (i) ✗
(ii) ✓
(b) Factors of 21 = 1, 3, 7, 21
(i) May not occur
(ii) May occur

2 (a) (iii) {31, 32, 33, 34, 35, 36, 37, 38, 39, 40} [✓]
(b) (i) ✓ (ii) ✗ (iii) ✓

3 (a)



(b) May not occur

Section C

1 (a) (i) Probability $= \frac{64}{400}$

$= \frac{4}{25}$

(ii) Probability $= \frac{82}{160}$

$= \frac{41}{80}$

(iii) Probability $= \frac{21}{105}$

$= \frac{1}{5}$

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

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

(ii) $P(B) = \frac{2}{8} = \frac{1}{4}$

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

$= 1 - \frac{1}{4} = \frac{3}{4}$

(c) (i) $P(\text{Yellow card}) = 1 - \frac{7}{15}$

$= \frac{8}{15}$

(ii) Initial number of yellow cards

$= \frac{8}{15} \times 90 = 48$

$\frac{48 - x}{90 - x} = \frac{2}{5}$

$5(48 - x) = 2(90 - x)$

$240 - 180 = -2x + 5x$

$3x = 60$

$x = 20$

20 yellow cards were removed.

2 (a) (i) Probability $= \frac{12}{24 + 13 + 16 + 18 + 12 + 17}$

$= \frac{12}{100}$

$= \frac{3}{25}$

(ii) Probability $= 1 - \frac{(16 + 18)}{100}$

$= 1 - \frac{34}{100}$

$= 1 - \frac{17}{50}$

$= \frac{33}{50}$

(b) $S = \{16, 17, 18, ..., 40\}$

$n(S) = 25$

(i) {20, 25, 30, 35, 40}

Probability $= \frac{5}{25}$

$= \frac{1}{5}$

(ii) Prime numbers

$= \{17, 19, 23, 29, 31, 37\}$

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

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

$= \frac{19}{25}$

(c) (i) $S = \{(3, E), (3, T), (5, E), (5, T), (7, E), (7, T), (9, E), (9, T)\}$

(ii) (a) {(3, E), (9, E)}

Probability $= \frac{2}{8}$

$= \frac{1}{4}$

(b) {(3, T), (5, T), (7, T)}

Probability $= \frac{3}{8}$