



eClassroom

GCSE Mathematics

Two-Way Tables & Frequency Trees

Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics



Section A — Foundation — Worked Solutions

[Fluency] Question 1

Only Maths=12–8=4, Only Science=15–8=7, Neither=30–4–7–8=11

(a) $P(\text{Maths})=12/30=2/5$

(b) $P(\text{both})=8/30=4/15$

(c) $P(\text{at least one})=19/30$

\therefore (a) $2/5$ (b) $4/15$ (c) $19/30$

[Fluency] Question 2

Only coffee=20, Only tea=15, Both=10, Neither=5

(b) $\text{Neither}=50-20-15-10=5$

(c) $P(\text{tea not coffee})=15/50=3/10$

\therefore (b) 5 (c) $3/10$

[Fluency] Question 3

Sport (25): instrument=20, no instrument=5

No sport (15): instrument=9, no instrument=6

(a) $P(\text{instrument})=29/40$

(b) $P(\text{sport} \cap \text{instrument})=20/40=1/2$

\therefore (a) $29/40$ (b) $1/2$

[Reasoning] Question 4

Total: Male=52, Female=48, Total=100

(a) $P(\text{pass})=80/100=4/5$

(b) $P(\text{female})=48/100=12/25$

(c) $P(\text{pass} \cap \text{female})=38/100=19/50$

\therefore (a) $4/5$ (b) $12/25$ (c) $19/50$

[Reasoning] Question 5

(a) $P(\text{pass}|\text{female})=38/48=19/24$

(b) $P(\text{female}|\text{pass})=38/80=19/40$

(c) $P(\text{pass}) \times P(\text{female})=0.8 \times 0.48=0.384$. $P(\text{pass} \cap \text{female})=38/100=0.38 \neq 0.384 \rightarrow$ not independent

\therefore (a) $19/24$ (b) $19/40$ (c) Not independent



**[Problem Solving] Question 6**

Male (120): positive=36, negative=84. Female (80): positive=20, negative=60

(b) $P(\text{positive}) = \frac{56}{200} = \frac{7}{25}$

(c) $P(\text{male}|\text{positive}) = \frac{36}{56} = \frac{9}{14}$

\therefore **(b) 7/25 (c) 9/14**

[Problem Solving] Question 7

Two-way: Route A: on time=30, late=20. Route B: on time=24, late=6. Total late=26.

(b) $P(\text{late}) = \frac{26}{80} = \frac{13}{40}$

(c) $P(\text{route A}|\text{on time}) = \frac{30}{54} = \frac{5}{9}$

\therefore **(b) 13/40 (c) 5/9**



Section B — Higher — Worked Solutions

[Fluency] Question 1

A only=20, B only=11, Both=8, Neither=11

(b) $P(A \cup B) = 39/50$

(c) $P(A|B) = 8/19$

(d) $P(A' \cap B) = 11/50$

\therefore (b) 39/50 (c) 8/19 (d) 11/50

[Fluency] Question 2

A(60): B=42, B'=18. A'(40): B=12, B'=28

(b) $P(B) = 54/100 = 0.54$

(c) $P(A|B) = 42/54 = 7/9$

\therefore (b) 0.54 (c) 7/9

[Reasoning] Question 3

Male: pass=84, fail=36. Female: pass=56, fail=24

(b) $P(\text{pass}|\text{female}) = 56/80 = 7/10$

(c) $P(\text{male}|\text{pass}) = 84/140 = 3/5$

\therefore (b) 7/10 (c) 3/5

[Reasoning] Question 4

$P(\text{pass}) = 140/200 = 0.7$. $P(\text{male}) = 120/200 = 0.6$

$P(\text{pass}) \times P(\text{male}) = 0.7 \times 0.6 = 0.42$. $P(\text{pass} \cap \text{male}) = 84/200 = 0.42$

$P(\text{pass} \cap \text{male}) = P(\text{pass}) \times P(\text{male}) \rightarrow$ independent ✓

\therefore Gender and result are independent ✓

[Problem Solving] Question 5

A(600): defective=30, ok=570. B(400): defective=32, ok=368

(b) $P(\text{defective}) = 62/1000 = 0.062$

(c) $P(A|\text{defective}) = 30/62 = 15/31$

\therefore (b) 0.062 (c) 15/31



**[Problem Solving] Question 6**

(a) $P(Y10 \cap \text{walks}) = 35/300 = 7/60$

(b) Total bus = $45 + 60 = 105$. $P(Y11 | \text{bus}) = 60/105 = 4/7$

(c) $P(\text{bus}) = 105/300 = 7/20$. $P(Y11) = 200/300 = 2/3$.

$P(Y11) \times P(\text{bus}) = 7/30 \neq P(Y11 \cap \text{bus}) = 60/300 = 1/5 = 6/30 \rightarrow$ not independent

\therefore (a) **7/60** (b) **4/7** (c) **Not independent**

