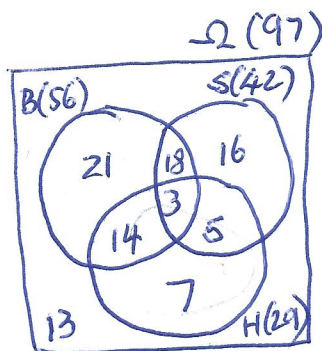


PRACTICE questions



| | GRADE 10 | GRADE 11 | Total |
|--------|----------|----------|-------|
| Museum | 76 | 24 | 100 |
| skiing | 30 | 40 | 70 |
| Hiking | 12 | 18 | 30 |
| Total | 118 | 82 | 200 |

a) $P(\text{Grade 10} \cap \text{Hiking}) = \frac{12}{200}$

b) $P(\text{Museum} | \text{Grade 10}) = \frac{76}{118}$

c) $P(H^c) = \frac{13+21+18+16}{97} = \frac{68}{97}$

d) $P(B | \text{"Plays at least 2 sports"}) = \frac{14+3+18}{18+14+3+5} = \frac{35}{40}$

e) $P(S|H) = \frac{3+5}{29} = \frac{8}{29}$

f) $P(B \cap H) = \frac{14+3}{97} = \frac{17}{97}$

g) $P(S^c) = \frac{21+13+14+7}{97} = \frac{55}{97}$

h) $P(B \cup H) = \frac{21+18+3+14+5+7}{97} = \frac{68}{97}$

i) $P(S | B \cup H) = \frac{18+3+5}{68} = \frac{26}{68}$

j) $P(H | B^c) = \frac{7+5}{13+7+5+16} = \frac{12}{41}$

k) $P(\text{"Plays exactly 2 sports"} | B \cup S \cup H) = \frac{14+18+5}{97-13} = \frac{37}{84}$

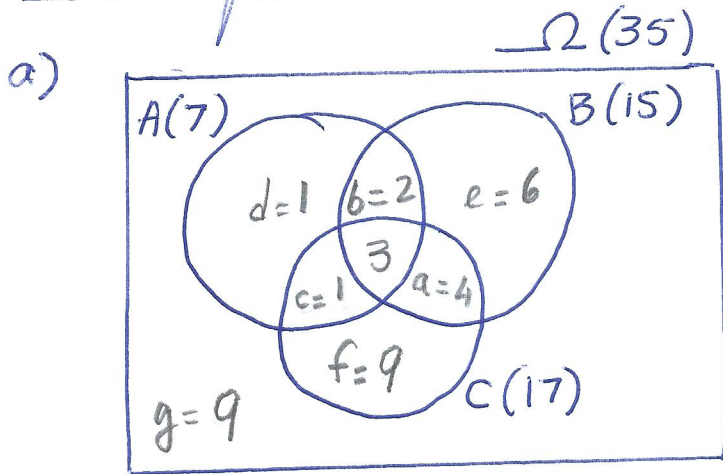
l) $P[(B \cup S)^c] = \frac{13+7}{97} = \frac{20}{97}$

m) $P(\text{Museum} \cup \text{skiing}) = \frac{100+70}{200} = \frac{170}{200}$

n) $P(\text{Grade 11} | \text{Museum} \cup \text{Hiking}) = \frac{24+18}{100+30} = \frac{42}{130}$

o) $P[(\text{Hiking})^c] = \frac{170}{200}$

Visions 2 p. 94 #9



$\#A = 7$
 $\#B = 15$
 $\#C = 17$
 $\#A \cap B \cap C = 3$
 $\#B \cap C = 7 \rightarrow a = 4$
 $\#A \cup C = 20$
 $\#B \cup C = 25$

A: choosing a left-handed person
 B: choosing a person who wear glasses
 C: choosing a person with brown hair

$\#A \cap B = 5 \rightarrow b = 5 - 3 = 2 \rightarrow e = 15 - (2 + 3 + 4) = 6$

$\#B \cup C = 25 \rightarrow c = 25 - (2 + 3 + 4 + 6) = 10 = c + f$

$\rightarrow c + f + d + 2 + 3 + 4 = 20$

$\rightarrow 10 + d + 9 = 20$

$\rightarrow d = 1$

$\rightarrow c = 7 - (1 + 2 + 3) \rightarrow c = 1$

$\rightarrow f = 17 - (1 + 3 + 4) \rightarrow f = 9$

$\rightarrow g = 35 - (1 + 1 + 2 + 3 + 4 + 6 + 9)$
 $g = 9$

b) Set-builder notation

1) $B \cap A$; 2) $A \cap (B \cup C)$; $(C \cap B) \cup (A \cap C)$

c) 1) $P(A \cup B) = \frac{17}{35}$; 2) $P(A \cap B) = \frac{5}{35}$; 3) $P(A \cup B \cup C) = \frac{26}{35}$

4) $P((A \cap B) \cap C) = \frac{3}{35}$; 5) $P((A \cup B) \cap C) = \frac{8}{35}$; 6) $P((B \cap C) \cup A) = \frac{11}{35}$

p. 94 #9

$$d) 1) P(B \cap C') = \frac{2+6}{35} = \frac{8}{35}$$

$$2) P(B' \cap A') = \frac{10+8}{35} = \frac{18}{35}$$

$$3) P(A \cap (B' \cap C')) = \frac{1}{35}$$

Additional Questions

p. 94, #9

- e) Calculate the probability of choosing a person who has brown hair given that he/she wears glasses.
- f) Calculate the probability of choosing a person who wears glasses given that he/she is left-handed.
- g) Calculate the probability of choosing a person who has brown hair given that he/she is left-handed or wears glasses.

Answers:

$$e) P(C | B) = \frac{3+4}{15} = \frac{7}{15}$$

$$f) P(B | A) = \frac{3+2}{7} = \frac{5}{7}$$

$$g) P(C | A \cup B) = \frac{1+3+4}{1+1+2+3+4+6} = \frac{8}{17}$$

p. 102, #6 Drill Bits Factory

| | No. Defective ND | Defective DF | Total |
|----------------------------|---------------------|-----------------|-------|
| # Wood drill bits (W) | 540 | 34 | 574 |
| # Cement drill bits (C) | 870 | 56 | 926 |
| Total | 1410 | 90 | 1500 |

a) ① $P(W) = \frac{574}{1500}$

② $P(DF|C) = \frac{56}{926}$

③ $(W|DF) = \frac{34}{90}$

b) Selecting 2 defective wood drill bits successively (Not a conditional probability)

$$\frac{574}{1500} \times \frac{573}{1499} = \frac{328902}{2248500} = 0.146276184 \approx 14.6\%$$

→ if two drills of the same type is selected what's the probability of rejecting
 ↑
 Conditional Probability

① all the wood drill bits

1st wood drill → $P(W|DF) = \frac{34}{90}$

2nd wood drill → $P(W|DF-1) = \frac{33}{89}$

② Rejecting all of the cement drill bits

→ $\frac{56}{90} \times \frac{55}{89} = \frac{3080}{8010} = 0.3845$

or 38.5%

→ Probability of rejecting all the wood drill bits is $\frac{34}{90} \times \frac{33}{89} = \frac{1122}{8010} = 0.1400$

or 14%