ANSWERS: GR 11 PROBABILITY

1   1.1   S = {(1,H); (2,H); (3,H); (4,H); (5,H); (6,H); (1,T); (2,T); (3,T); (4,T); (5,T); (6,T)}
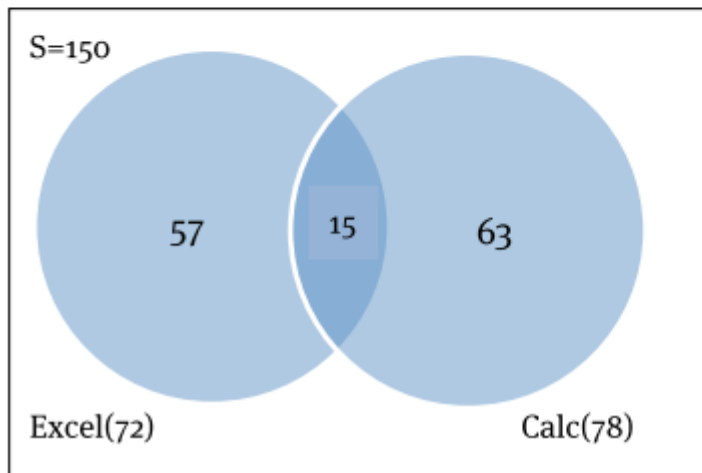
1.2   1.2.1 P(odd and head) = $\frac{3}{12}$ = $\frac{1}{4}$ = 0,25

1.2.2 P(prime and tail) = $\frac{3}{12}$ = $\frac{1}{4}$ = 0,25

1.2.3   P(less than 5 and head) = $\frac{4}{12}$ = $\frac{1}{3}$ = 0,333

1.2.4   P(even and tail) = $\frac{3}{12}$ = $\frac{1}{4}$ = 0,25

2   2.1

2.2   2.2.1   15   2.2.2   63   2.2.3   57   2.2.4   15

2.3   2.3.1 $\frac{15}{50}$ = 0,1   2.3.2 $\frac{63}{150}$ = 0,42

2.3.3 $\frac{57}{150}$ = 0,38   2.3.4 $\frac{15}{50}$ = 0,1

3   3.1   P(a number less than 4) = $\frac{4}{5}$ = 0,8

3.2   P(a number greater than 4) = $\frac{1}{5}$ = 0,2

3.3   P(a number greater than or equal to 4) = $\frac{2}{5}$ = 0,4

3.4   P(divisible by 3) = $\frac{1}{5}$ = 0,2
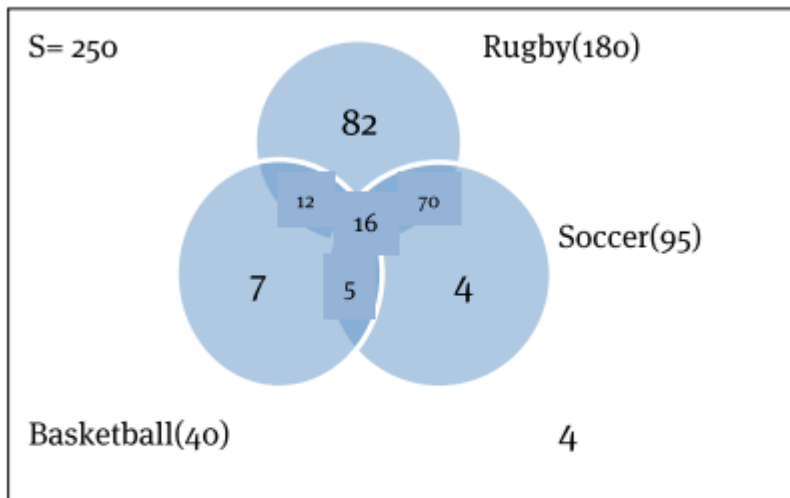
3.5   P(not divisible by 3) = $\frac{4}{5}$ = 0,8

3.6   3.4 and 3.5 are each other's complements.

3.1 and 3.3 are not each other's complements.

4   4.1

S= 250   Rugby(180)

82

12   70

16

Soccer(95)

7   5   4

Basketball(40)   4

4.2   4 members

4.3   16 members

4.4   41,2%

5       $P(A) = \frac{2}{5}$; $P(B) = \frac{5}{12}$; $P(C) = \frac{1}{3}$

Let's check for mutual exclusivity:

$P(A) \times P(B) = \frac{1}{6}$

$P(A) \times P(C) = \frac{2}{15}$

$P(B) \times P(C) = \frac{5}{36}$

5.1 $P(A \text{ or } C) = P(A) + P(C) - P(A \cap C)$

$= \frac{2}{5} + \frac{1}{3} - \frac{2}{15} = \frac{3}{5} = 0,6$

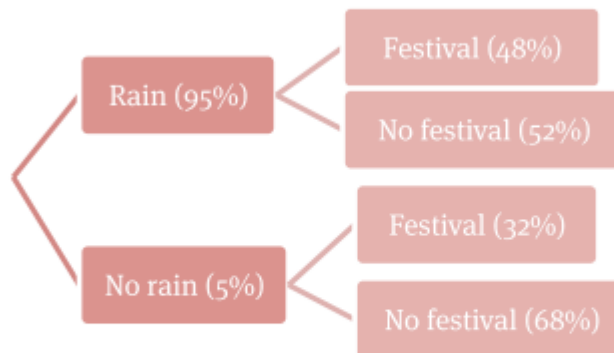5.2 $P(A \text{ or } B) = P(A) + P(B) - P(A \cap B)$

$\frac{2}{5} + \frac{5}{12} - \frac{1}{6} = \frac{13}{20} = 0,65$

$\therefore 1 - P(A \text{ or } B) = 1 - 0,65 = 0,35$

6   6.1

6.2   6.2.1   P(festival) = 0,95 × 0,48 + 0,05 × 0,32 = 0,472 = 47,2%

6.2.2   P(no festival in wet weather) = 0,95 × 0,52 = 0,494 = 49,4%

7   7.1

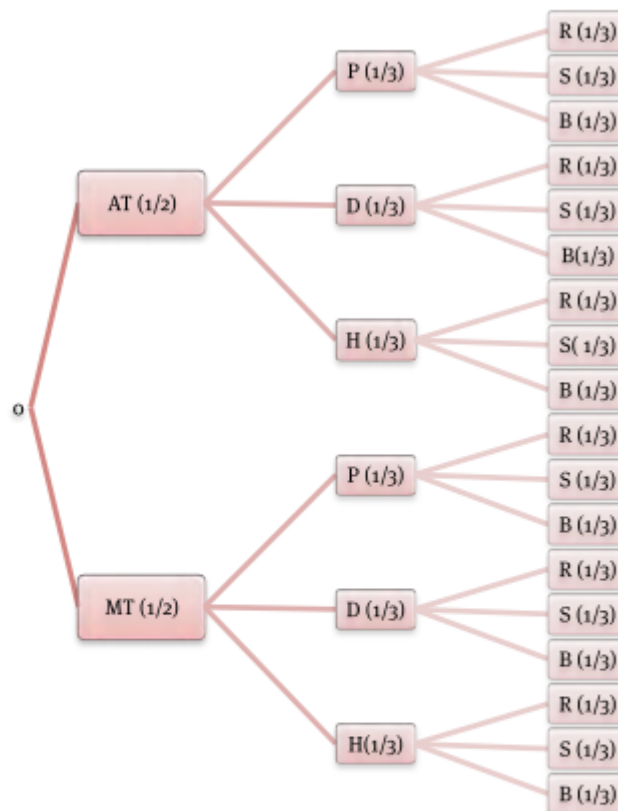|	More than 5 cups	Less than 5 cups	Total
Female	672	1 565	2 237
Male	1 485	1 173	2 658
Total	2 157	2 738	4 895

7.2   7.2.1   P(female drinks more than 5 cups a day) $= \frac{672}{4895} = 0,1373$

7.2.2   P(female) $= \frac{2237}{4895} = 0,4570$

7.2.3   P(a person drinks more than 5 cups a day) $= \frac{2157}{4895} = 0,4407$

7.3   own answers.

8   8.1

8.2   8.2.1   P(black) = $\frac{6}{18}$ = $\frac{1}{3}$

8.2.2   P(AT with H) = $\frac{1}{6}$

8.2.3   P(MT with D and R) = $\frac{1}{18}$

8.2.4   P(P with S) = $\frac{1}{3}$