

# Assignment

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## Question 11.16.3.11

The accompanying venn diagram shows three events, A, B and C, and also the probabilities of the various intersections (for instance,  $\Pr(AB) = 0.7$ ). Determine

- 1)  $\Pr(A)$
- 2)  $\Pr(B.C^c)$
- 3)  $\Pr(A + B)$
- 4)  $\Pr(A.B^c)$
- 5)  $\Pr(B.C)$
- 6) Probability of exactly one of the three occurs

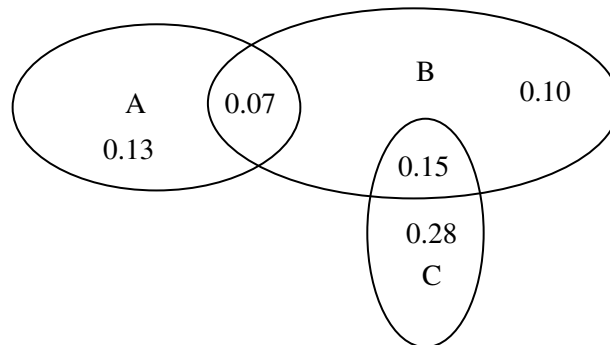


Fig. 1: generated by Latextikz

### Solution:

1)

$$\begin{aligned}\Pr(A) &= 0.13 + 0.07 \\ &= 0.2\end{aligned}\tag{1}$$

2)

$$\begin{aligned}\Pr(B.C^c) &= \Pr(B) - \Pr(B.C) \\ &= 0.07 + 0.10 + 0.15 - 0.15 \\ &= 0.17\end{aligned}\tag{3}$$

3)

$$\begin{aligned}\Pr(A + B) &= \Pr(A) + \Pr(B) - \Pr(A.B) \\ &= 0.20 + (0.07 + 0.10 + 0.15) - 0.07 \\ &= -0.45\end{aligned}\tag{6}$$

4)

$$\Pr(A.B^c) = \Pr(A) - \Pr(A.B) \quad (9)$$

$$= 0.20 - 0.07 \quad (10)$$

$$= 0.13 \quad (11)$$

5)

$$\Pr(B.C) = 0.15 \quad (12)$$

6)

$$\Pr(\text{exactly one of the 3 occurs}) = 0.13 + 0.10 + 0.28 \quad (13)$$

$$= 0.51 \quad (14)$$