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) $\Pr(BC')$
3) $\Pr(A + B)$
4) $\Pr(AB')$
5) $\Pr(BC)$
6) Probability of exactly one of the three occurs

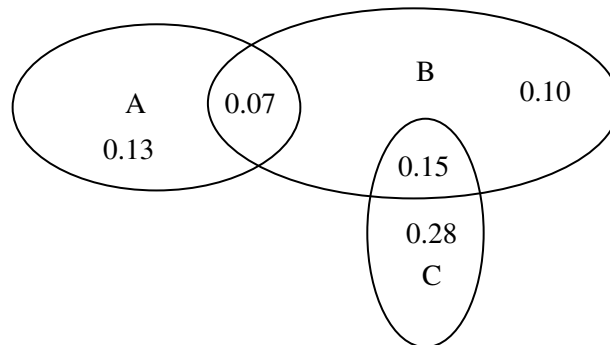Fig. 1: generated by Latextikz

Solution: Given:

$$\Pr(AB) = 0.07 \tag{1}$$
$$\Pr(AB') = 0.13 \tag{2}$$
$$\Pr(BC) = 0.15 \tag{3}$$
$$\Pr(BA'C') = 0.10 \tag{4}$$
$$\Pr(CB') = 0.28 \tag{5}$$

1)

$$\Pr(A) = 0.13 + 0.07 \tag{6}$$
$$= 0.2 \tag{7}$$

2)

$$\Pr(BC') = 0.07 + 0.10 + 0.15 - 0.15 \tag{8}$$
$$= 0.17 \tag{9}$$

3)

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \tag{10}$$
$$= 0.20 + (0.07 + 0.10 + 0.15) - 0.07 \tag{11}$$
$$= 0.45 \tag{12}$$

4)

$$\Pr(AB') = 0.20 - 0.07 \tag{13}$$
$$= 0.13 \tag{14}$$

5)

$$\Pr(BC) = 0.15 \tag{15}$$

6)

$$\Pr(AB') + \Pr(CB') + \Pr(BA'C') = 0.13 + 0.10 + 0.28 \tag{16}$$
$$= 0.51 \tag{17}$$