

Question 11.16.3.27

Probability and Random Processes

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Question:11/16/3/27

If the probabilities for A to fail in an examination is 0.2 and that for B is 0.3, then the probability that either A or B fails is

- 1) > 0.5
- 2) 0.5
- 3) ≤ 0.5
- 4) 0

Solution:

Event	Description
A	A fails
B	B fails

TABLE 4: Event description

Given,

$$\Pr(A) = 0.2 \quad (1)$$

$$\Pr(B) = 0.3 \quad (2)$$

$$(3)$$

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \quad (4)$$

$$= 0.2 + 0.3 - \Pr(AB) \quad (5)$$

$$= 0.5 - \Pr(AB) \quad (6)$$

By the first axiom of Probability

$$0 \leq \Pr(AB) \quad (7)$$

$$0.5 - \Pr(AB) \leq 0.5 \quad (8)$$

$$\Pr(A + B) \leq 0.5 \quad (9)$$