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## Exercise: Independence of two events - III

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### Exercise: Independence of two events - III

2/2 points (graded)

When is an event  $A$  independent of itself?

Choose one of the following possible answers:

☐ Always

☐ If and only if  $P(A) = 0$

☐ If and only if  $P(A) = 1$

☒ If and only if  $P(A)$  is either 0 or 1 ✓

Answer:

Using the definition,  $A$  is independent of itself if and only if

$$P(A \cap A) = P(A) \cdot P(A).$$

Since  $A \cap A = A$ , we have  $P(A \cap A) = P(A)$  and we obtain the equivalent condition

$$P(A) = P(A) \cdot P(A),$$

or

$$P(A) \cdot (1 - P(A)) = 0,$$

and this happens if and only if  $P(A)$  is either 0 or 1.

You have used 1 of 2 attempts

✓ Correct (2/2 points)

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