

Events **A** and **B** are such that  $P(A) = 0.4$  and  $P(A \cup B) = 0.7$

Find  $P(B)$  if **A** and **B** are independent.

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If **A** and **B** are independent,  $P(A \cap B) = P(A) \times P(B)$

$$P(A \cap B) = 0.4 \times P(B)$$

We know that  $P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$$0.7 = 0.4 + P(B) - 0.4 \times P(B)$$

$$0.3 = P(B) - 0.4 \times P(B)$$

$$0.3 = 0.6P(B)$$

$$P(B) = \frac{0.3}{0.6}$$

$$P(B) = \frac{1}{2}$$