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Math • AP®/College Statistics • Probability • Conditional probability

Calculate conditional probability

AP.STATS: VAR-4 (EU), VAR-4.D (LO), VAR-4.D.1 (EK)

CCSS.Math: [HSS.CP.B.6](#)

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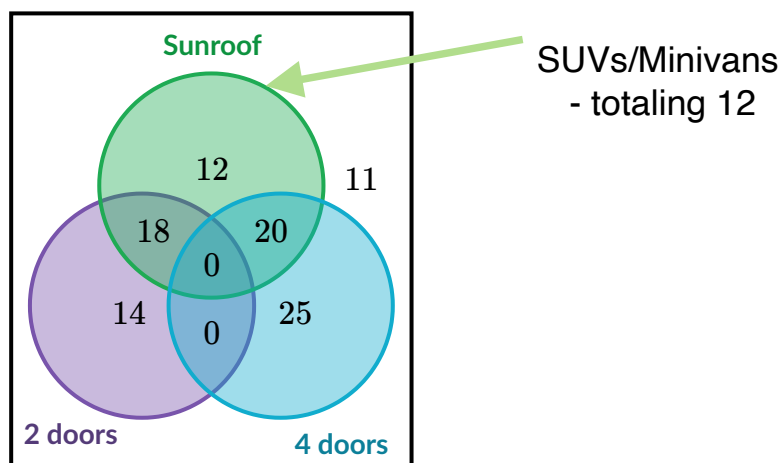
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A business owner noted the features of the 100 cars parked at the business.



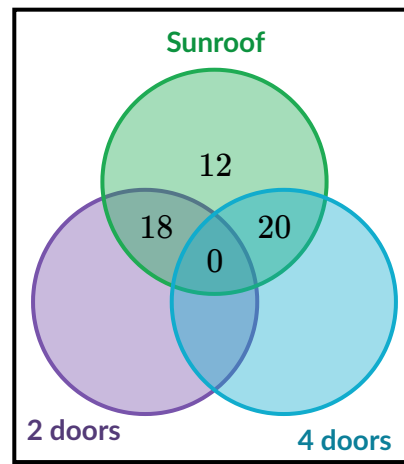
Given that a randomly selected car has a sunroof, find the probability the

$$P(4 \text{ doors} \mid \text{sunroof}) = \boxed{0.80}$$

1 / 3

Intuitive way

The condition is that the car has a sunroof, so we should only look at the Sunroof part of the diagram:



So we have $12 + 18 + 0 + 20 = 50$ cars under the condition the probability that a car in that group had 4 doors:

$$P(4 \text{ doors} \mid \text{sunroof}) = \frac{20 + 0}{50} = \frac{2}{5}$$

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Using conditional probability formula

$$P(4 \text{ doors} \mid \text{sunroof}) = \frac{P(4 \text{ doors and sunroof})}{P(\text{sunroof})}$$

$$= \frac{\frac{20}{100}}{\frac{12 + 18 + 20}{100}}$$

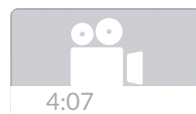
$$= \frac{20}{12 + 18 + 20} = \frac{20}{50} = \frac{2}{5}$$

3 / 3

The answer:

$$P(4 \text{ doors} \mid \text{sunroof}) = \frac{2}{5}$$

Related content



Conditional probability and independence

**Do 4 problems****Check again****◀ Conditional probability using two-way tables****Conditional probability and independence ▶**

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