

In-Video Quiz Questions for  
Unit 2: Part 1 – (2) Independence

(03:55)

1. According to a 2013 Pew Research Poll that surveyed 1,504 Americans, 67% of respondents said that they believe the Earth is warming. Roughly 50% of Republicans, 88% of Democrats, and 62% of Independents share this opinion. Based on these data, opinion on global warming and political leaning are most likely
- (a) complementary
  - (b) mutually exclusive
  - (c) independent
  - (d) dependent
  - (e) disjoint

Link to poll: <http://www.people-press.org/2013/11/01/gop-deeply-divided-over-climate-change/>

(05:38)

2. Earlier we saw that  $P(\text{protects citizens} \mid \text{White}) = 0.67$  and  $P(\text{protects citizens} \mid \text{Hispanic}) = 0.64$ . Under which sample size would you be more convinced of a real difference between the proportions of Whites and Hispanics who think gun widespread gun ownership protects citizens?
- 0.48
- (a)  $n = 500$
  - (b)  $n = 40,000$

(09:58)

3. In a multiple choice exam, there are 5 questions and 4 choices for each question (a, b, c, d). You have not studied at all and decide to randomly guess the answers. What is the probability that you get all 5 questions correct?
- (a)  $0.25^5 \approx 0.00098$
  - (b)  $0.2^4 = 0.0016$
  - (c)  $0.5^5 = 0.03125$
  - (d)  $0.25 \times 5 = 1.25$
  - (e)  $4 / 5 = 0.8$

## Answers:

1. d

*Explanation:* The probability that someone believes the Earth is warming varies by their political affiliation, hence political affiliation and believing that the Earth is warming appear to be dependent. If they were independent, the conditional probabilities of believing that the Earth is warming would be the same given each political affiliation.

2. b

*Explanation:* Larger the sample size, the more convincing the evidence from that sample.

3. a

*Explanation:* For each question, the probability of getting it right by randomly guessing is  $1 / 4 = 0.25$ . Since you're randomly guessing getting one question right is independent of another. To find the probability  $P(5 \text{ questions right})$  we use the multiplication rule for independent events:

$$P(\text{all 5 right}) = P(1^{\text{st}} \text{ right}) \times P(2^{\text{nd}} \text{ right}) \times \dots \times P(5^{\text{th}} \text{ right})$$

$$= 0.25 \times 0.25 \times \dots \times 0.25$$

$$= 0.25^5$$

$$\approx 0.00098$$