(09:26) – slide 6, after "So that's n is 9, k is 2 actually yields the same 36 scenarios."

1. Which of the following is false?

 Hint: Try calculating these with real numbers, by plugging in some number of your choice for *n*.

(a)There are n ways of getting 1 success in n trials, $\binom{n}{1} = n$.

(b)There is only 1 way of getting n success in n trials, $\binom{n}{n} = 1$.

(c)There is only 1 way of getting 0 success in n trials, $\binom{n}{0} = 1$.

(d)There are n-1 ways of getting n-1 success in n trials, $\binom{n}{n-1} = n - 1$.

(11:43) – slide 9, after "So we set our number of successes k equal to eight."

2. According to a 2013 Gallup poll, worldwide only 13% of employees are engaged at work (psychologically committed to their jobs and likely to be making positive contributions to their organizations). We are interested in finding the probability that among a random sample of 10 employees, what is the probability that 8 of them are engaged at work.

Without doing any calculations, would you expect this probability to be pretty low or pretty high?

(a) pretty low

(b) pretty high

(13:51) – slide 9, after "That's why what we're looking for here is a highly unlikely outcome, and highly unlikely means a very low probability."

3. A 2012 Gallup survey suggests that 26.2% of Americans are obese. Among a random sample of 20 Americans, what is the probability that exactly 5 are obese?

(a) $0.262^5 \times 0.738^{15}$

(b) $\binom{5}{20} 0.262^5 \times 0.738^{15}$

(c) $\binom{20}{5} 0.262^5 \times 0.738^{15}$

(d) $\binom{20}{5} 0.262^{15} \times 0.738^5$

(17:12) – slide 11, after "These values represent what we would expect to see on average."

4. A 2012 Gallup survey suggests that 26.2% of Americans are obese. Which of the following is false?

(a) Among a random sample of 1,000 Americans, we would expect 262 to be obese.

(b) Random samples of 1,000 Americans where there are at most 230 are obese people would be considered unusual.

(c) The standard deviation of number of obese Americans in random samples of 1,000 is roughly 14.

(d) Random samples of 1,000 Americans where there are at least 300 are obese people would not be considered unusual.

Answers:

1. d

Explanation: $\binom{n}{n-1} = n$

For example, there are 3 ways of choosing 2 successes out of 3: SSF, SFS, FSS.

2. a

Explanation: Among a sample of 10, we would only expect 10×0.13=1.3 people to be engaged at work, so getting a random sample where 8 out of 10 are engaged would be pretty unlikely.

3. c

Explanation: $p = 0.262, n = 20, k = 5$

$$\binom{20}{5} 0.262^5 \times 0.738^{15}$$

4 d

Explanation: $\mu = 1000 \times 0.262 = 262$

$$\sigma = \sqrt{1000 \times 0.262 \times 0.738} \approx 14$$

Range of "usual" observations: $262 \pm 2 \times 14 = (234,290)$, anything beyond these would be considered unusual.