

Math 153 - Quiz 8

October 26, 2017

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) In a certain town, 47% of the children dress as vampires on Halloween.

(a) In a random sample of 20 children, what is the expected number of vampires?

$$\mu = np = 20(0.47) = \boxed{9.4}$$

(b) In a sample of 20, what would be an unusually large number of vampires? Show work to justify your reasoning.

$$\mu + 2\sigma = np + 2\sqrt{npq} = 9.4 + 2\sqrt{(9.4)(0.53)} \\ \approx 13.84$$

14 or more
ARE UNUSUAL

2. (6 points) A certain YouTube video gets viewed 43 times per hour on average.

(a) In any given hour, what is the probability that the video gets viewed exactly 40 times?

$$P(x=40) = \text{poissonpdf}(43, 40) \approx \boxed{0.0565}$$

(b) In any given hour, what is the probability that the video gets viewed fewer than 40 times?

$$P(x < 40) = P(x \leq 39) = \text{poissoncdf}(43, 39) \\ \approx \boxed{0.3031}$$

(c) In any given hour, what is the probability that the video gets viewed at least 45 times?

$$P(x \geq 45) = 1 - P(x < 45) \\ = 1 - P(x \leq 44) \\ = 1 - \text{poissoncdf}(43, 44) \\ \approx \boxed{0.4002}$$

Poisson
 $\lambda = 43$