12a

Math 153 - Quiz 7

March 22, 2018

Name key (a)

Score _____

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

1. (2 points) The probability distribution for the random variable x is shown below. Use the 5% rule to determine the unusual values of x. Briefly explain your reasoning.

x	1	2	3	4	5	6	7
$P(x)$	0.06	0.02	0.02	0.80	0.06	0.03	0.01

Already > 5%

$P(x \geq 6) = 4\% < 5\%$

No unusually small values

6 & 7 are unusually large

2. (8 points) Based on a recent Gallup Poll, the probability that a random American adult supports the legalization of marijuana is 60%. Suppose 19 American adults are selected at random.

Binomial
$n = 19$
$p = 0.60$
$q = 0.40$

(a) What is the probability that more than 12 support legalization?

$P(x > 12) = 1 - P(x \leq 12) = 1 - \text{binomcdf}(19, 0.60, 12)$

≈ 0.3081

(b) What is the probability that 13 support legalization?

$P(x = 13) = \text{binompdf}(19, 0.60, 13) \approx 0.1451$

(c) What is the probability that fewer than 6 support legalization?

$P(x \leq 5) = \text{binomcdf}(19, 0.60, 5) \approx 0.0031$

(d) In the sample of 19, what would be an usually small number of people who support legalization? (Show your work.)

$\mu - 2\sigma = np - 2\sqrt{npq} \approx 7.13$

7 or fewer