

**Math 153 - Quiz 7**

April 4, 2013

Name key

Score \_\_\_\_\_

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

1. (2 points) On any given night, there is a 13% chance that Sam will enjoy his dinner. In a week, what is the probability that Sam will enjoy his dinner at least once?

BINOMIAL

$$N = 7$$

$$p = 0.13$$

$$P(x \geq 1) = 1 - P(x \leq 0)$$

$$= 1 - \text{binomialcdf}(7, 0.13, 0) \approx \underline{\underline{62.3\%}}$$

2. (6 points) Joe has been struggling with his classes. He has determined that the probability that he will pass any given test is 0.38. He has 7 tests left to take this semester.

BINOMIAL

$$N = 7$$

$$p = 0.38$$

$$P(x = 4) = \text{binomialpdf}(7, 0.38, 4)$$

$$\approx 17.4\%$$

- (a) What is the probability that he will pass 4 of the tests?

$$P(x \geq 4) = 1 - P(x \leq 3)$$

$$= 1 - \text{binomialcdf}(7, 0.38, 3) \approx 25.2\%$$

- (c) How many of the tests should he expect to pass?

$$\mu = np = 7(0.38) = \underline{\underline{2.66}}$$

- (d) What would be an unusually large number of tests to pass?

$$\sigma = \sqrt{npq}$$

$$= \sqrt{7(0.38)(0.62)} \approx 1.28$$

$$\mu + 2\sigma \approx 5.22 \Rightarrow \underline{\underline{6 \text{ TESTS}}}$$

3. (2 points) Suppose  $x$  is a random variable in a binomial distribution with  $q = 0.65$  and  $n = 20$ . Compute  $P(x \geq 12)$ .

$$N = 20$$

$$q = 0.65 \Rightarrow p = 0.35$$

$$P(x \geq 12) = 1 - P(x \leq 11)$$

$$= 1 - \text{binomialcdf}(20, 0.35, 11)$$

$$\approx \underline{\underline{1.96\%}}$$