

# Math 153 - Quiz 8

April 18, 2013

Name key Score \_\_\_\_\_

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

1. (2 points) The lengths of hospital stays are normally distributed with mean 4.8 days and standard deviation 1.4 days. About what percent of hospital stays last longer than 7 days?

$$\text{normalcdf}(7, 99999, 4.8, 1.4)$$

$$\approx 5.8\%$$

2. (3 points) 38% of adult Internet users have made an online purchase. 200 adult Internet users are randomly selected.

(a) What is the probability that 100 or more have made an online purchase?

BINOMIAL

$$N = 200$$

$$p = 0.38$$

$$P(X \geq 100) = 1 - P(X < 100)$$

$$= 1 - P(X \leq 99)$$

$$= 1 - \text{binomialcdf}(200, 0.38, 99)$$

$$= 0.000365$$

(b) What would be an unusually large number of people who have made an online purchase?

$$\mu = 200 \times 0.38 = 76$$

$$\sigma = \sqrt{200 \times 0.38 \times 0.62} \approx 6.86$$

$$76 + 2 \times 6.86 = 89.72$$

90 or more would be

unusually large.

3. (3 points) Suppose there are 200 typographical errors randomly distributed in a 500-page manuscript.

(a) What is the average number of typos per page?

$$\frac{200}{500} = 0.4 \text{ Typos/page}$$

(b) What is the probability that any given page will contain 2 or more types?

$$\begin{aligned} P(x \geq 2) &= 1 - P(x < 2) \\ &= 1 - P(x \leq 1) \\ &= 1 - \text{poissoncdf}(0.4, 1) \\ &\approx 6.2\% \end{aligned}$$

4. (2 points) The Rockefeller family is pretty wealthy, but they've decided to live with the "average joes." They are buying a home in a neighborhood where the home prices are normally distributed with mean \$319,000 and standard deviation \$18,500. Mrs. Rockefeller will only consider a house that is more expensive than 98% of the neighborhood houses. What is the cheapest house she will consider?

$$\begin{aligned} &\text{invNorm}(0.98, 319000, 18500) \\ &\approx \$356,994.35 \end{aligned}$$

5. (3 points extra credit) Is this a binomial distribution? Give a clear explanation of your answer.

$x$	0	1	2	3
$P(x)$	0.064	0.288	0.432	0.216

Yes, CHECK AND SEE.

THIS IS BINOMIAL WITH  $p = 0.6$  AND  $N = 3$ .