Math 153 - Quiz 8

April 14, 2016

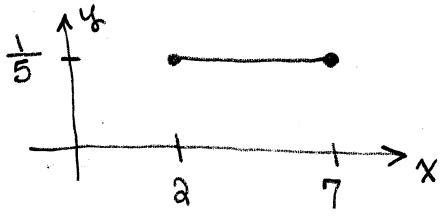
Name key

Score _____

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

1. (4 points) A random number generator generates uniformly distributed random numbers between 2 and 7. Let the random variable x represent a randomly generated number.

   (a) Sketch the probability density curve for x.



   (b) What is the probability that x is between 3 and 5?

$$P(3<x<5) = (5-3)\left(\tfrac{1}{5}\right) = \boxed{\tfrac{2}{5}}$$

2. (4 points) A certain bank gets an average of 27 customers per hour.

   (a) What is the probability that the bank has more than 30 customers in any given hour?

Poisson $\mu = 27$

$$P(x>30) = 1 - P(x \le 30)$$

$$= 1 - \text{poissoncdf}(27, 30) \approx \boxed{0.2447}$$

   (b) What is an unusually small number of hourly customers?

$$\mu - 2\sigma = 27 - 2\sqrt{27} \approx 16.6 \Rightarrow \boxed{\text{16 or Fewer}}$$

3. (2 points) Certain aspirin tablets have weights that are normally distributed with mean 250 mg and standard deviation 5 mg. What is the proability that a randomly selected tablet will weigh exactly 249 mg?

$$P(x = 249) = \boxed{0}$$

(EXACT VALUE IN A CONT. DISTRIBUTION HAS PROB ZERO.)