Quiz 6A

Name:

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Closed book/notes. Scientific calculators only. Correct answers and all work must be shown to receive full credit.

1. Suppose x has a uniform distribution on $(1, 9)$.

   (a) (2 pts.) Find the height of the density curve. *Hint:* What is the density function? Award one point for the numerator and one point for the denominator.

   $$f(x) = \frac{1}{8} \qquad \longrightarrow \qquad \text{height} = \frac{1}{8} \tag{1}$$

   (b) (3 pts.) Compute $P(x \leq 7)$. Award two points if the student multiplies the density function by the difference in the limits (one point per piece as shown in (2)), and award one point for the correct answer.

   $$P(x \leq 7) = \frac{1}{8}(7 - 1) \tag{2}$$
   $$= 75\% \tag{3}$$

2. (5 pts.) Suppose x is a discrete random variable with the probability distribution shown below.

x	1	2	3	4
$p(x)$	0.15	0.20	0.25	0.40

   The mean is found to be $E(x) = \mu = 2.9$. Compute the standard deviation of x. Round your answer to *three* decimal places. Award one point for each of the following (no fractional points allowed - all or nothing):

   - The student includes all four deviations from the mean.
   - The student squares all four deviations from the mean.
   - The student multiplies all four squared deviations by the associated probability.
   - The student takes the square root.
   - The student gives the correct answer with the correct rounding.

   $$\sigma = \sqrt{.15(1 - 2.9)^2 + .2(2 - 2.9)^2 + .25(3 - 2.9)^2 + .4(4 - 2.9)^2} \tag{4}$$
   $$\approx 1.091 \tag{5}$$

Formulas You May Need:

$$\sigma = \sqrt{\sum (x - \mu)^2 p(x)} = \sqrt{\sum_x \left[(x - \mu)^2 p(x) \right]} \tag{6}$$

Grade: /10