

Full Name: _____

Student No: _____

Grade:

For each answer, **provide a short argument.**

1. (3 points) Suppose X and Y are two random variables with joint probability density function

$$f(x, y) := \begin{cases} 4e^{-2y} & \text{if } 0 < x < y < \infty, \\ 0 & \text{otherwise.} \end{cases}$$

- (a) Find the marginal distribution of X .

Answer:

- (b) Find the marginal distribution of Y .

Answer:

- (c) Find the probability that $Y > 2X$.

Answer:

2. (3 points) The weight of a potato can be thought of as a random variable with a mean of 170 grams and a standard deviation of 15 grams. A sack is filled with 50 potatoes.

(a) What are the mean and standard deviations of the weight of the potato sack?

Answer:

(b) What is the (approximate) probability that the sack weighs less than 8.4 kilograms?

Answer:

(c) What is the (approximate) probability that the average weight of 4 similarly packed sacks is less than 8.4?

Answer:

3. (0 points) On the scale of 0–6, what is your estimate of your grade on this quiz?