

The random variable Y is defined by $Y = \sqrt{X}$.

$$f(x) = \begin{cases} \frac{1}{16}\sqrt{x} & 0 \leq x < 4, \\ \frac{1}{k\sqrt{x}} & 4 \leq x \leq 9, \\ 0 & \text{otherwise,} \end{cases}$$

The random variable Y is defined by $Y = \sqrt{X}$.

- (c) Find the probability density function of Y .

[2]

- [3]

(c) Given that $E(X) = \frac{529}{150}$, find $\text{Var}(X)$. [3]

$$F(x) = \begin{cases} 0 & x < 1, \\ \frac{1}{5}x + a & 1 \leq x < 4, \\ \frac{1}{50}x^2 + b & 4 \leq x \leq 6, \\ 1 & x > 6, \end{cases}$$

[illegible]

- (d) Find the 10th and 90th percentiles of X . [3]

-
- This image shows a full page of a handwriting practice worksheet. It consists of ten sets of horizontal dashed lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

The random variable Y is defined by $Y = \sqrt{X}$.

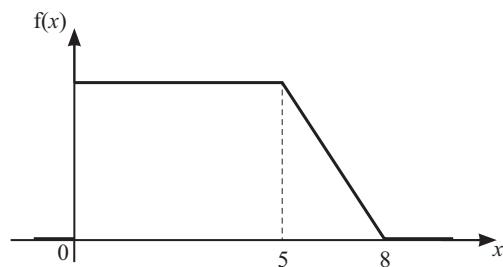
$$f(x) = \begin{cases} \frac{4}{9}(x+1) & 0 \leq x \leq 1, \\ (x-2)^2 & 1 < x \leq 2, \\ 0 & \text{otherwise.} \end{cases}$$

- (c) Find the cumulative distribution function of Y .

[3]

- (d) Determine whether the median of Y is greater than, or less than, the median of X .

[2]


$$f(x) = \begin{cases} a & 0 \leq x \leq 5, \\ b - cx & 5 \leq x \leq 8, \\ 0 & \text{otherwise,} \end{cases}$$

(a) Show that $a = \frac{2}{13}$ and find the values of b and c .

[3]

- (b) Find the mean of X . [3]

[illegible]

- (c) Find the median of X . [2]

.....

.....

.....

.....

.....

(d) Find the cumulative distribution function for Y . [4]

[illegible]

3 A continuous random variable X has probability density function f given by

$$f(x) = \begin{cases} kx & 0 \leq x < 1, \\ k(8-x) & 1 \leq x \leq 8, \\ 0 & \text{otherwise,} \end{cases}$$

where k is a constant.

- (a) Show that $k = \frac{1}{25}$. [2]

(b) Find the median value of X . [3]

The random variable Y is defined by $Y = \sqrt[3]{X}$.

- (c) Find the probability density function of Y . [5]

[illegible]