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3. The continuous random variable X is uniformly distributed over the interval $[-1,3]$.
Find

- (a) $E(X)$ (1)
- (b) $\text{Var}(X)$ (2)
- (c) $E(X^2)$ (2)
- (d) $P(X < 1.4)$ (1)

A total of 40 observations of X are made.

- (e) Find the probability that at least 10 of these observations are negative. (5)



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5. A continuous random variable X has the probability density function $f(x)$ shown in Figure 1.

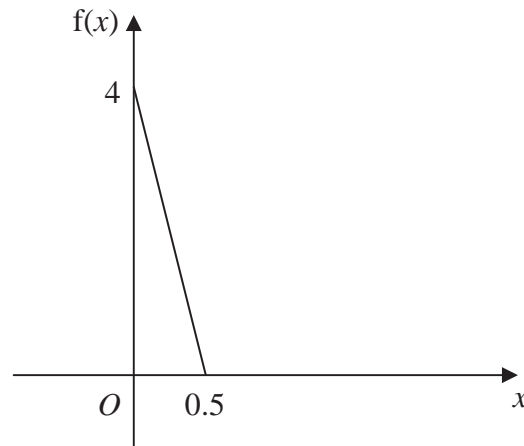


Figure 1

- (a) Show that $f(x) = 4 - 8x$ for $0 \leq x \leq 0.5$ and specify $f(x)$ for all real values of x . **(4)**
- (b) Find the cumulative distribution function $F(x)$. **(4)**
- (c) Find the median of X . **(3)**
- (d) Write down the mode of X . **(1)**
- (e) State, with a reason, the skewness of X . **(1)**



