Stat 134: Section 14

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Problem 1

Suppose X has density $f(x) = c/x^4$ for $x > 1$, $f(x) = 0$ otherwise, where c is a constant. Find

Recall that a probability density function has to be integrated to 1.

a. c;

b. $E(X)$;

c. $\text{Var}(X)$.

Ex 4.1.2 in Pitman's Probability

Problem 2

Suppose that X is a random variable whose density is

$$f(x) = \frac{1}{2(1 + |x|)^2}, (-\infty < x < \infty)$$

a. Draw the graph of $f(x)$.

b. Find $P(-1 < X < 2)$.

c. Find $P(|X| > 1)$.

d. Is $E(X)$ defined?

Ex 4.1.5 in Pitman's Probability

Problem 3

A large lot of marbles have diameters which are approximately normally distributed with a mean of 1cm. One third have diameters greater than 1.1 cm. Find:

a. the standard deviation of the distribution;

b. the proportion whose diameters are within 0.2 cm of the mean;

c. the diameter that is exceeded by 75% of the marbles.

Ex 4.1.11 in Pitman's Probability