

L11QUE: Quantitative Economics
L11QUM: Quantitative Methods
L11MES: Mathematical and Economic Statistics

Tutorial 3

1. X is a continuous random variable with probability density function (PDF)

$$f(x) = \frac{1}{9}x^2, \quad 0 \leq x \leq 3$$

- (a) Find the following probabilities:

(i) $P(0 \leq X \leq 1)$

(ii) $P(0 \leq X \leq 2)$

(iii) $P(1 \leq X \leq 2)$

- (b) Find the expected value and variance of X .

2. The random variable Z has a standard normal distribution.

- (a) Find the following probabilities:

(i) $P(0 < Z < 1.20)$

(ii) $P(-1.33 < Z < 0)$

(iii) $P(Z > 1.33)$

(iv) $P(-0.77 < Z < 1.68)$

- (b) Find x given that $P(x < Z < 1.68) = 0.2$

3. The tread life of a particular brand of tyre has a normal distribution with mean 35,000 miles and standard deviation 4,000 miles.

- (a) What is the probability that a tyre of this brand will have a tread life between 35,000 and 38,000 miles?

- (b) What is the probability that a tyre of this brand will have a tread life of less than 32,000 miles?