

2. A continuous random variable Y has the probability density function given at the right.

$$f(y) = \begin{cases} k(1 - y^3) & ; \quad 0 < y \leq 1 \\ 0 & ; \quad \text{otherwise} \end{cases}$$

MARKS

8

(3, 1, 2, 2)

- (a) Evaluate the constant k and sketch the p.d.f. of Y .
- (b) Find the mean of Y .
- (c) Find the standard deviation of Y .
- (d) Find *an expression* for the value of c so that $\Pr(-c < Y \leq c) = 0.8$.

BONUS: Find the value of c in (d) correct to 3 decimal places.

(a)

(a)

k

(b)

(b)

Mean

(c)

(c)

Standard deviation

(d)

(d)

Expression for c

BONUS (2 marks)