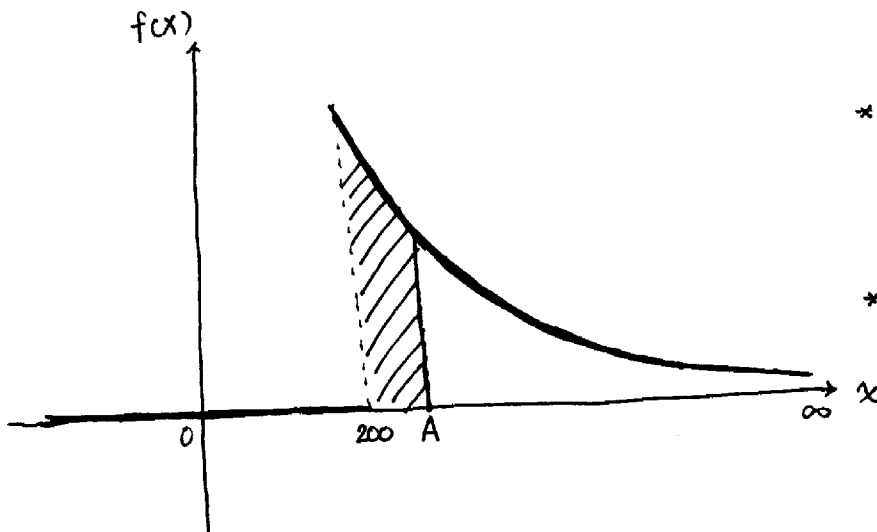


EXAM P PROBLEM 061

* Important Concept : Percentile

- In statistics, a percentile is the value of a variable below which a certain percent of observations fall.
- In this problem, the 25th percentile is the value below which 25 percent of the observations may be found.



- * If point A is the 25th percentile, the shaded area includes 25% of the observations
- * The shaded area makes up 25% of the total area below the graph

Denote ~~the~~ the 25th percentile as Q_1
 Denote the 75th percentile as Q_3

$$\frac{1}{4} = \int_{200}^{Q_1} f(x) dx \quad \text{Alternatively} \quad \frac{3}{4} = \int_{Q_1}^{\infty} f(x) dx$$

$$\text{Solve } \frac{3}{4} = \int_{Q_1}^{\infty} f(x) dx = (200/Q_1)^{2.5} \Rightarrow Q_1 = 224.4$$

Similarly

$$\frac{1}{4} = \int_{Q_3}^{\infty} f(x) dx \quad \text{Alternatively}$$

$$\frac{3}{4} = \int_{200}^{Q_3} f(x) dx$$

$$\Rightarrow Q_3 = 348.2$$

$$Q_3 - Q_1 = 348.2 - 224.4 = 123.8$$

