

Problem 59

$$f(x) = \frac{2.5(200)^{2.5}}{x^{3.5}} \quad x > 200$$

$C_1$ : 30<sup>th</sup> percentile

$C_2$ : 70<sup>th</sup> percentile

Want  $C_2 - C_1$

$$\% = \int_{-\infty}^{\text{percentile}} f(x) \cdot dx$$

$$\% = \int_{200}^{\text{percentile}} \frac{2.5(200)^{2.5}}{x^{3.5}} dx$$

$$\% = 1 - \left(\frac{200}{\text{percentile}}\right)^{2.5} \Rightarrow \text{percentile} = 200(1 - \%)^{-.4}$$

$$C_1 = 200(1 - .3)^{-.4} = 230.67$$

$$C_2 = 200(1 - .7)^{-.4} = 323.73$$

$$C_2 - C_1 = 323.73 - 230.67$$

$$= 93$$

93 B