

Claim Size (X)	# of Claims
(0, 25]	25
(25, 50]	28
(50, 100]	15
(100, 200]	6

} 74

$$\int_{150}^{200} (x^2 - 150^2) \left(\frac{6}{7400}\right) dx$$

$$\left(\frac{x^3}{3} - 150^2 x\right) \left(\frac{6}{7400}\right) \Big|_{150}^{200}$$

$$(337.84)$$

Estimate: $E(X^2) - E((X - 150)^2)$

$$E(X^2) = \int_0^{200} x^2 f(x) dx$$

$$E((X - 150)^2) = E(X^2 - 150^2)$$

$$(X - 150)^2 = (X^2 - 150^2)$$

$$E((X - 150)^2) = \int_0^{150} x^2 f(x) dx + 150^2 \int_{150}^{200} f(x) dx$$

$$\int_0^{200} x^2 f(x) dx - \int_0^{150} x^2 f(x) dx - 150^2 \int_{150}^{200} f(x) dx$$

$$\int_0^{150} x^2 f(x) dx + \int_{150}^{200} x^2 f(x) dx$$

$$- \int_0^{150} x^2 f(x) dx - 150^2 \int_{150}^{200} f(x) dx$$

$$= \int_{150}^{200} (x^2 - 150^2) f(x) dx$$

$$f(x) \text{ on } 150 \text{ to } 200$$

$$= f(x) \text{ on } 100 \text{ to } 200$$

$$= \text{Prob}(\text{Claim in interval}) / \text{Width}$$

$$= \frac{6}{74} \cdot \frac{1}{200 - 100}$$

$$= \frac{6}{7400}$$