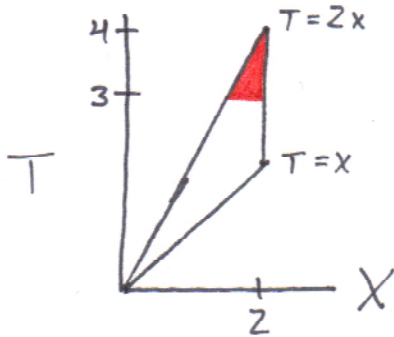


Problem 120

T : time in hours to process a claim

$T \sim \text{Uniform}[x, 2x] \Rightarrow f(T|X=x)$



$$P(T \geq 3): 3 \leq T \leq 4 \\ \frac{1}{2} \leq X \leq 2$$

$$f(x, T) = f(x) \cdot f(T|X=x)$$

$$\frac{3}{8}x^2$$

$$\frac{1}{2x-x} = \frac{1}{x}$$

$$f(x, T) = \frac{3}{8}x$$

$$P(T \geq 3) = \frac{3}{8} \int_3^4 \int_{T/2}^2 x \cdot dx \cdot dT$$

$$= \frac{3}{8} \int_3^4 2 - \frac{T^2}{8} \cdot dT$$

$$= \frac{3}{8} \left(2t - \frac{t^3}{24} \right) \Big|_3^4 = \underline{\underline{.17187}}$$

A