Assignment # 05

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$$f(x) = \begin{cases} 1/2 & 0 < x < 2 \\ 0 & \text{otherwise} \end{cases}$$

cost $= 4 + 3\sqrt{x}$ when time is x

expected cost ?

Let $E(x)$ be the expected cost given by

~~$E(x) = \int_0^2 f(x)(4+3\sqrt{x})\,dx$~~

$$E(X) = \int_0^2 f(x)(4+3\sqrt{x})\,dx$$

$$= \int_0^2 \frac{1}{2}(4+3\sqrt{x})\,dx$$

$$= \int_0^2 \left(2 + \frac{3}{2}\sqrt{x}\right)dx$$

$$= 2x + \frac{3}{2}\left(\frac{x^{3/2}}{3/2}\right)\Bigg|_0^2$$

$$= 2x + \left(\frac{3}{2}\right)\left(\frac{2}{3}\right)x^{3/2}\Bigg|_0^2$$

$$= 2x + x^{3/2} \Big|_0^2$$

$$= 4 + 2^{3/2}$$

$$= 4 + \sqrt{8}$$

$$= 6.83 \quad \text{ans}$$