

$$35) \quad f(x) = \begin{cases} C(10+x)^{-2} & 0 < x < 40 \\ 0 & \text{otherwise} \end{cases}$$

$$\Pr(X < 5) = ?$$

$$1 = \int_{-\infty}^{\infty} f(x) dx = \int_0^{40} C(10+x)^{-2} dx$$

$$1 = -C(10+x)^{-1} \Big|_0^{40}$$

$$1 = \frac{C}{10} - \frac{C}{50}$$

$$\Rightarrow C = 12.5$$

$$\Pr(X < 5) = \int_0^5 12.5(10+x)^{-2} dx$$

$$= -12.5(10+x)^{-1} \Big|_0^5$$

$$= \frac{12.5}{10} - \frac{12.5}{15}$$

$$= 0.42$$

\boxed{C}