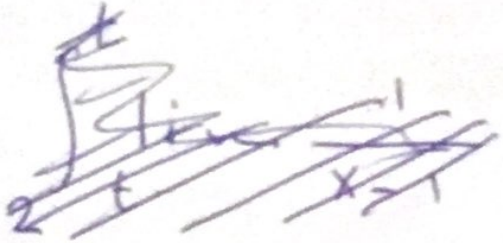
$$\int_2^{\infty} \frac{1}{x-1}\,dx =$$

$$\lim_{t\to\infty} \int_2^{t} \frac{1}{x-1}\,dx =$$



$$\lim_{t\to\infty} \Big[\ln|x-1|\Big]_2^{t}$$

$$\lim_{t\to\infty} \Big[\ln|t-1| - \ln|2-1|\Big] =$$

$\ln|2-1| = 0$

$$\lim_{t\to\infty} \ln|t-1| = \ln(\infty) = \infty$$