Problem statement

a) Compute $\int_1^2 \frac{dx}{x^2}$.

b) Compute $\int_1^2 \frac{dx}{x(x-m)}$ if $m$ is a small positive number. What happens when $m \to 0^+$?

c) Compute $\int_1^2 \frac{1}{x+n} \, dx$ if $n$ is a small positive number. What happens when $n \to 0^+$?

d) Sketch a graph of $\frac{1}{x^2}$, $\frac{1}{x(x-m)}$, and $\frac{1}{x+n}$ if $m$ and $n$ are both .1 for $x$ between 1 and 2.