9. [10 points] Suppose that f is function with the following properties:

f is differentiable f(x) > 0 for all x $\int_{1}^{\infty} f(x) dx$ converges.

For each of the following parts, determine whether the statement is always, sometimes, or never true by circling the appropriate answer. No justification is needed.

a. [2 points]
$$\int_{500}^{\infty} 1000f(x) dx$$
 converges.NEVERAIWAYSSOMETIMESNEVERb. [2 points] $\int_{1}^{\infty} (f(x))^{2/3} dx$ converges.NEVERAIWAYSSOMETIMESNEVERc. [2 points] $\int_{1}^{\infty} (f(x))^{3/2} dx$ converges.NEVERd. [2 points] $\int_{0}^{1} f\left(\frac{1}{x}\right) dx$ converges.NEVERe. [2 points] $\int_{1}^{\infty} \frac{f'(x)}{f(x)} dx$ converges.NEVERAIWAYSSOMETIMESNEVERAIWAYSSOMETIMESNEVERAIWAYSSOMETIMESNEVER