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## Work Sheet \#7

In this Work Sheet, we'll use derviatives to help us understand the graph of $f(x)=\frac{1}{x}-\frac{1}{x^{2}}$.

1. (a) What is the largest possible domain for $f(x)$ ?
(b) Compute $\lim _{x \rightarrow \infty} f(x)$
(c) Find all vertical and horizontal asymptotes of the graph of $y=f(x)$.
2. Compute $f^{\prime}(x)$ and simplify it into one fraction.
3. Where is the graph of $y=f(x)$ increasing and decreasing? Find all critical values.
4. What is the maximum value of $f(x)$ ? What is the range of $f(x)$ ?
5. Compute $f^{\prime \prime}(x)$ and simplify it into one fraction.
6. Where is the graph of $y=f(x)$ concave up and concave down? Find all inflection points.
7. Sketch a careful graph of $y=f(x)$. Plot all critical points and inflection points.
