MAC 2311

March 30, 2021 **Quiz 10 - Keeran & York**

Remember to show <u>all</u> of your work.

Problem 1. (9 points) Let $f(x) = \dfrac{x^3 - 16}{x}$. Then $f'(x) = \dfrac{2x^3 + 16}{x^2}$ and $f''(x) = \dfrac{2x^3 - 32}{x^3}$.

(a) Determine the domain of $f(x)$.

(b) Find any vertical / horizontal asymptotes of $f(x)$, if they exist.

(c) Identify any possible critical points.

(d) Find the intervals on which $f(x)$ is increasing / decreasing.

(e) Identify any possible inflection points.

(f) Find the intervals on which $f(x)$ is concave up / concave down.

(g) Graph $f(x)$ approximately (label any critical points, inflection points, asymptotes).

Hint: You can use the approximation $\sqrt[3]{16} \approx 2.5$

Problem 2. (1 point) In honor of April Fool's Day on Thursday, what's your favorite joke / pun?