(4 pts) 1. Find the domain of the function $f(x) = \frac{\sqrt{x-2}}{x^3 - 9}$.

\[ x - 2 \geq 0 \quad \text{and} \quad x^3 - 9 \neq 0 \]
\[ x \geq 2 \quad \text{and} \quad x^3 + 9 \]
\[ x + 3\sqrt{9} \approx 2.08 \]

\[ \text{Dom}(f) = [2, 2.08) \cup (2.08, \infty) \]

(6 pts) 2. Given $f(x) = 3x^2$,

(a) sketch its graph.

(b) determine the intervals that $f$ is increasing or decreasing.

(c) either by looking at the graph or doing algebra, determine if $f$ is even, odd, or neither. Justify your answer.

(a) \hspace{2cm} (b) decreasing: $(-\infty, 0)$

increasing: $(0, \infty)$

(c) even, because it is symmetric with respect to $y$-axis.

because $f(-x) = 3(-x^2) = 3x^2 = f(x)$