

**Honors Brief Calculus 5.1 – 5.3 Review**

#1. Sketch the graph  $f(x) = \frac{1}{6x^2 - 6}$

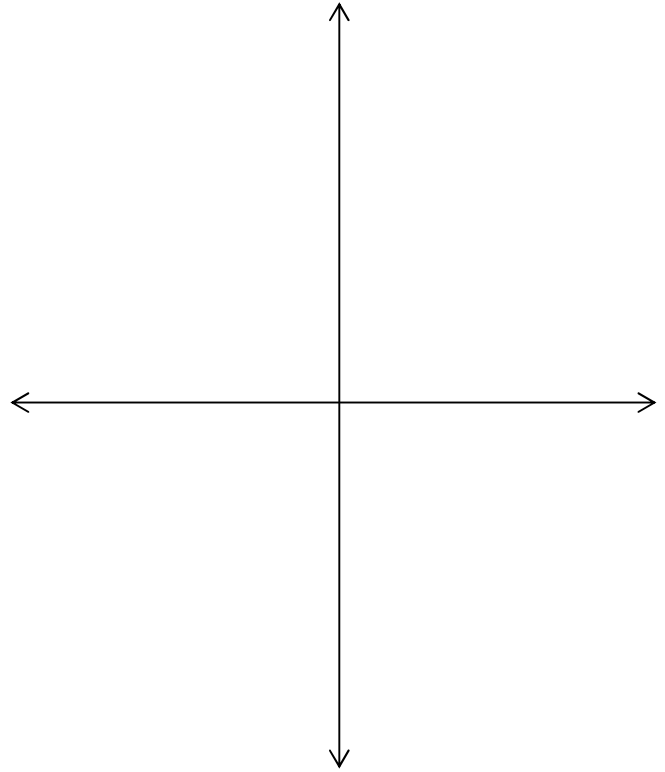
- a. Domain
- b. Intercepts
- c. Vertical asymptotes

Left/Right – hand behavior

$$\lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}}$$

$$\lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}}$$

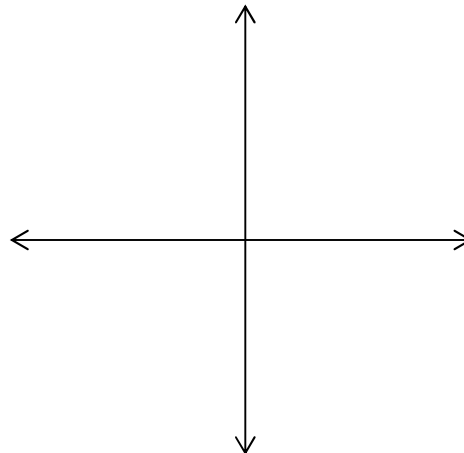
- d. Horizontal asymptotes
- e. Increasing
- f. Decreasing
- g. Maximum
- h. Minimum



**Organize your work/steps here!**

#2. Sketch the graph of a single function that has all the properties listed.

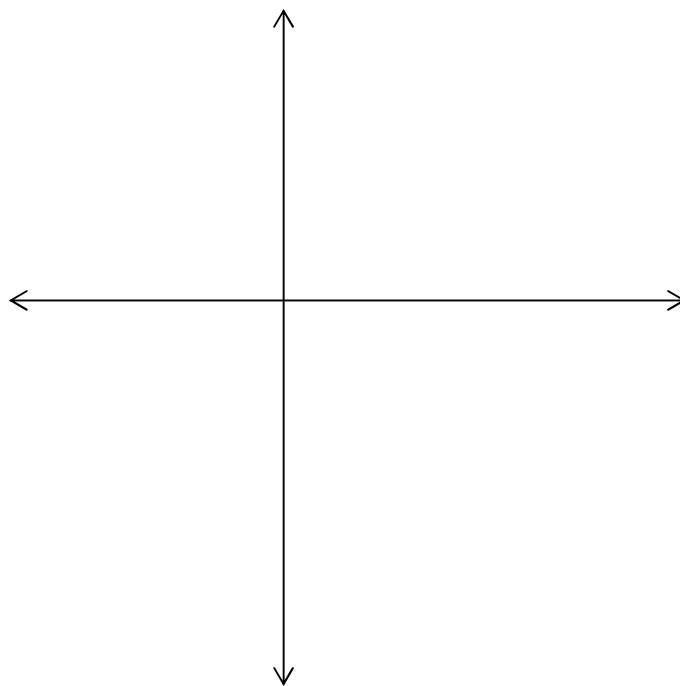
- a.  $y$ -intercept:  $(0, 2)$
- b.  $x$ -intercepts:  $(-4, 0)$   $(2, 0)$   $(4, 0)$
- c. relative minimum  $(3, -4)$
- d. relative maximum  $(-2, 4)$
- e. decreasing interval  $(-2, 3)$
- f. increasing intervals  $(-\infty, -2)$   $(3, \infty)$
- g. points of inflection  $(0, 2)$   $(-1, 3)$   $(2, 0)$
- h. concave up intervals  $(-1, 0)$   $(2, \infty)$
- i. concave down intervals  $(-\infty, -1)$  and  $(0, 2)$
- j.



#3. Sketch the graph.

$$f(x) = x^4 - 4x^3$$

- a. domain \_\_\_\_\_
- b. intercepts \_\_\_\_\_
- c. increasing \_\_\_\_\_
- d. decreasing \_\_\_\_\_
- e. maximum \_\_\_\_\_
- f. minimum \_\_\_\_\_
- g. concave up \_\_\_\_\_
- h. concave down \_\_\_\_\_
- i. point(s) of inflection \_\_\_\_\_
- j. left- and right-hand behavior



$$\lim_{x \rightarrow \infty} f(x) = \underline{\hspace{2cm}} \quad \lim_{x \rightarrow -\infty} f(x) = \underline{\hspace{2cm}}$$