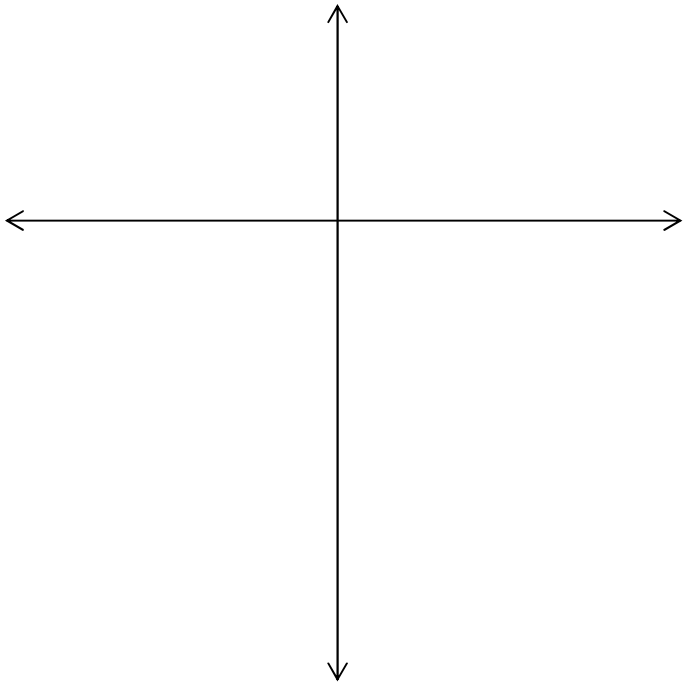
**Honors Brief Calculus** 5.1 – 5.3 Group Work Name_____

1. Sketch the graphs.

$$f(x) = x^4 - \frac{4}{3}x^3 - 4x^2 + 1$$



a. domain _____

b. intercepts_____

c. increasing_____

d. decreasing_____

e. maximum_____

f. minimum_____

g. concave up_____

h. concave down_____

i. point(s) of inflection_____

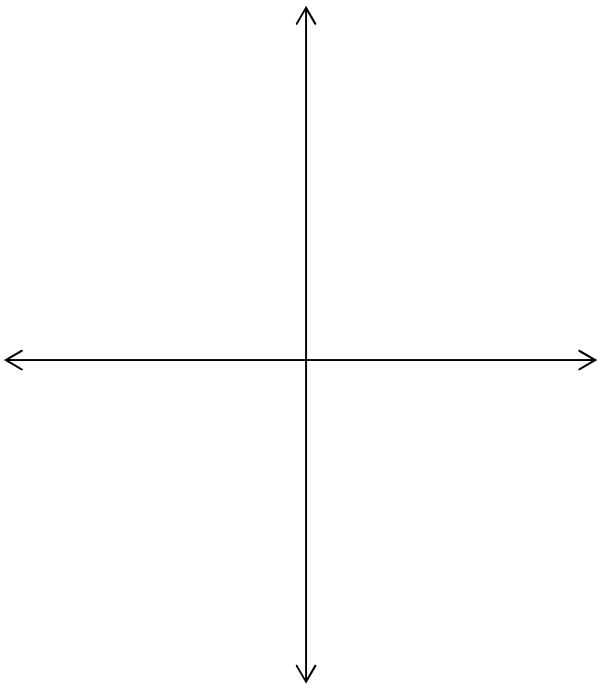
j. left- and right-hand behavior

$$\lim_{x\to\infty} f(x) = \_\_\_\_\_$$

$$\lim_{x\to-\infty} f(x) = \_\_\_\_\_$$

**Organize your work/steps here!**

2. Sketch the graph: $f(x)=\dfrac{x^2}{4-x^2}$



a. vertical asymptotes_____

b. left- and right-hand behavior

$\lim_{x\to\infty} f(x)=$ _____ $\lim_{x\to-\infty} f(x)=$ _____

c. horizontal asymptotes_____

d. $y$-intercepts_____

e. $x$-intercepts_____

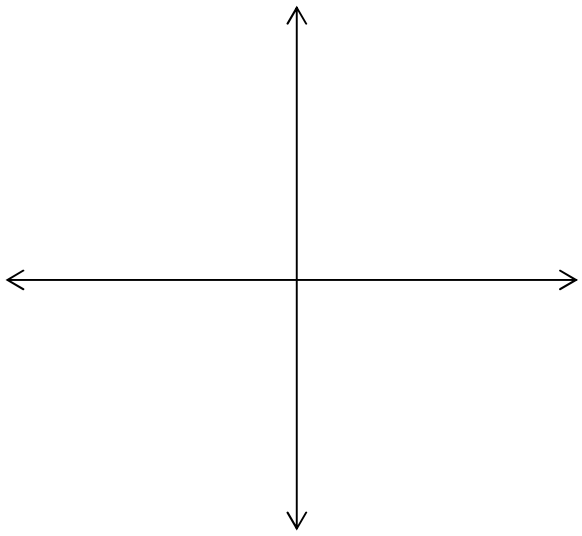
f. increasing_____

g. decreasing_____

h. maximum_____

i. minimum_____

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



a. $y$-intercept at $y=-2$

b. $x$-intercepts at $x=-3,\ 1,$ and $4$

c. continuous everywhere except at $x=-4$, where there is a vertical asymptote

d. decreasing on $(-\infty,-5)$, $(-4,-1)$, and $(2,\infty)$

e. increasing on $(-5,-4)$ and $(-1,2)$

f. concave upward on $(-\infty,-4)$ and $(-4,-3)$

g. concave downward on $(-3,-1)$ and $(-1,\infty)$

h. derivative exists everywhere except at $x=-4$ and $x=-1$