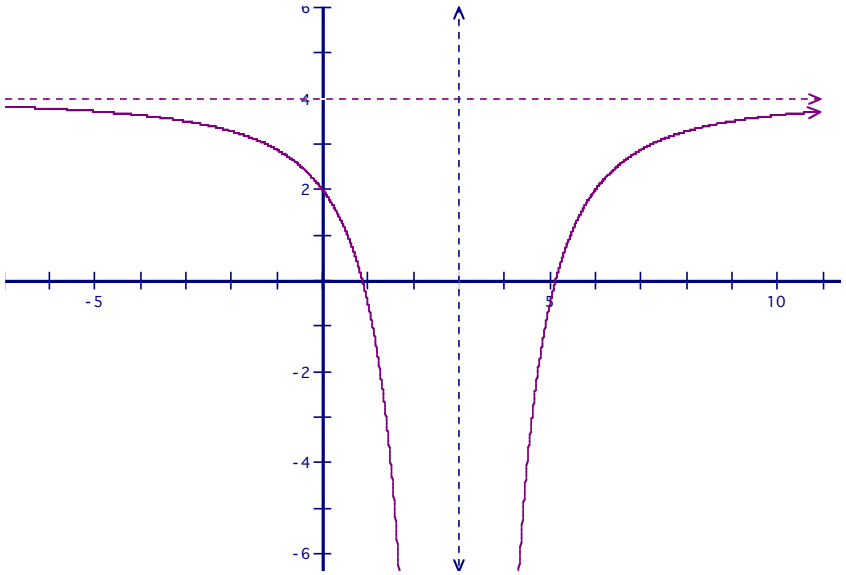
Day 3 HW: Explore Limits Selected Solutions

1c. Since the degree of the numerator is larger than the degree of the denominator when x is really big, the numerator will increase more quickly than the denominator making the function values increase without bound.

2c. As x gets really big the lead terms (those with the biggest exponent) begin to dominate and the terms with smaller exponents become inconsequential. In other words, when x is big the function $f(x)=\frac{x^4}{2x^4+x^2}$ begins to look like $f(x)=\frac{x^4}{2x^4}$ wich is ½. So, $\lim_{x\to\infty} f(x)=\frac{1}{2}$.

4a. See graph



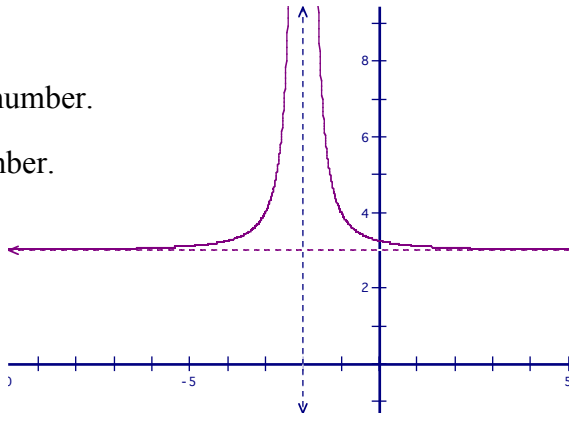
4b.

$\lim_{x\to\pm\infty} f(x) = 4$

$\lim_{x\to 3} f(x) = -\infty$

$\lim_{x\to 0} f(x) = 2$
(because f(0) = 2)

5a. See graph



5b. $f(x)=\frac{13}{(x+2)^2}+3$ Note: The numerator could be any number.
I just chose 13 'cause I like that number.

6b. 6