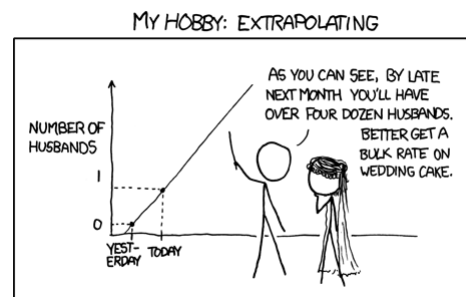


Worksheet 8: To Infinity and Beyond!

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- Find the limit or show that it does not exist: $\lim_{x \rightarrow \infty} x^2 - x$

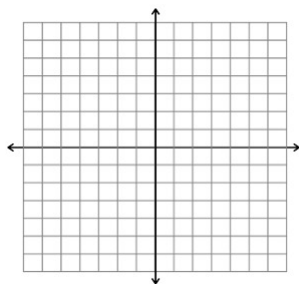


www.xkcd.com

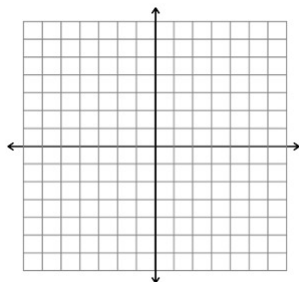
- Find the limit or show that it does not exist: $\lim_{x \rightarrow \infty} \frac{\sqrt{9x^6 - x}}{x^3 + 1}$

- Find the limit as $x \rightarrow \infty$ and $x \rightarrow -\infty$, use this information as well as the x and y intercepts to give a rough sketch of the graph:

$$f(x) = x^3(x + 2)^2(x - 1)$$

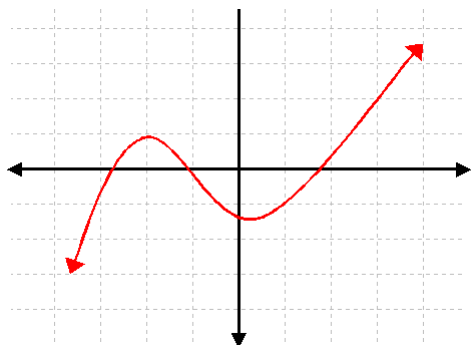


- Using a graph, find a number N such that if $x > N$, then $|\frac{x^2+1}{x^2} - 1| < \frac{1}{2}$.

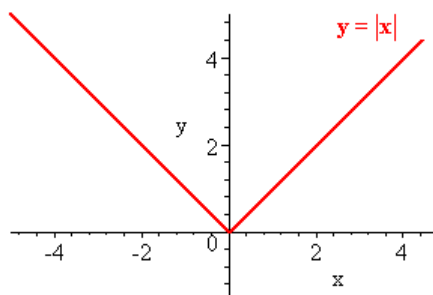


5. For each graph of a function $f(x)$ shown below; sketch the graph of its derivative.

(a)



(b)



6. Find the derivative of the function using the definition of derivative. State the domain of the function and the domain of its derivative.

(a) $f(x) = mx + b$

(b) $f(t) = 5t - 9t^2$

(c) $f(x) = x^4$