Name(s):

Math 157 | Curve Sketching | October 27, 2014

To sketch $y = f(x)$:

1. **Domain**. Where is the function defined?
2. **Intercepts**. y-intercept at $f(0)$. x-intercept(s) by solving $f(x) = 0$ for x.
3. **Symmetry**.

   Even if $f(-x) = f(x)$ for all x in the domain. y-axis symmetry.

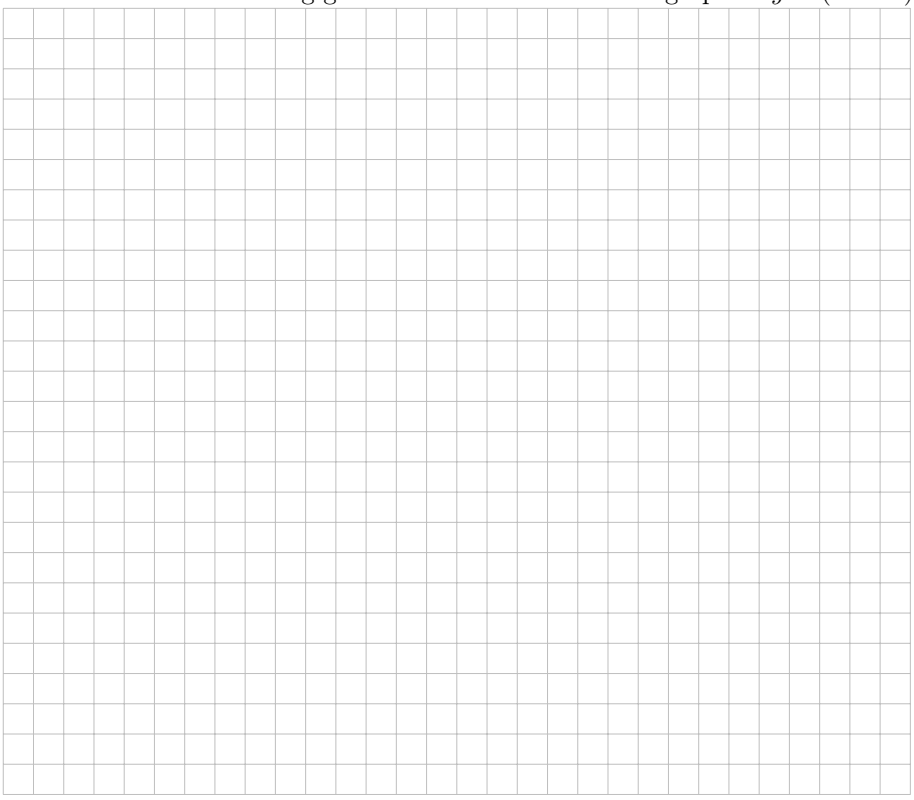
   Odd if $f(-x) = -f(x)$ for all x in the domain. Origin symmetry.

   Periodic if it repeats (like $y = \sin x$ or graphs of other trig functions).
4. **Asymptotes**.

   Horizontal (if any) at $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$.

   Vertical (if any) at places where $\lim_{x\to a^+} f(x) = \pm\infty$ or $\lim_{x\to a^-} f(x) = \pm\infty$ (watch for division by 0, which you should already have done in step 1). Determine how the function approaches any asymptotes.
5. **Increasing/Decreasing**. Use the first derivative.
6. **Local Extremes**. Use the information from the previous step and find the extreme values.
7. **Concavity and Inflection Points**. Use the second derivative.
8. **Draw it**.

1. Use the curve sketching guidelines above to draw the graph of $y = (x^2 - 1)^3$.



2. Use the curve sketching guidelines to draw the graph of $y = \dfrac{x}{x^3 - 1}$.