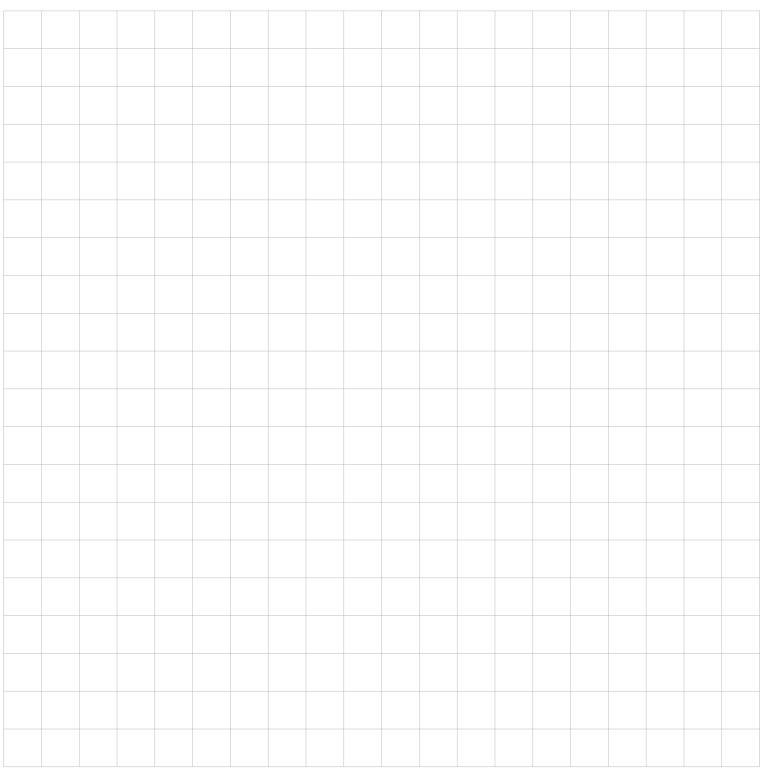
CURVE SKETCHING

Method. To sketch $y = f(x)$:

1. **Domain**. Where is the function defined?
2. **Intercepts**. $f(0)$ is the y-intercept. Find 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 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**. Use as many steps above as you can to choose a scale for your axes and draw an accurate graph. You may also want to plot extra points to help you see how everything fits together.

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



Date: November 1, 2021.

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