

Chapter 3

Applications of Derivatives

3.5 Summary of Curve Sketching

EXAMPLE 1 Use the guidelines to sketch the curve $y = \frac{2x^2}{x^2 - 1}$.

Guidelines for Sketching a Curve.

- A.** Find the domain of the function.
- B.** Find the y-intercept and x-intercept, that is $f(0)$ and when $y = 0$.
- C.** Search for symmetries in the function (facultative)
- If $f(x) = f(-x)$, then the function is even.
 - If $-f(x) = f(-x)$, then the function is odd.
 - If $f(x + p) = f(x)$, then the function repeats itself after a period p (it is periodic).
- D.** Find the asymptotes of the function:
- The Horizontal asymptotes.
 - The Vertical asymptotes.
- E.** Find the intervals of increase and decrease.
- F.** Find the local maximum and minimum values.
- G.** Find the concavity and the points of inflections.