

4.4. Additional Exponential Models

General Procedure for Sketching the Graph

- Step 1. Find the domain of $f(x)$.
- Step 2. Find and plot all intercepts.
- Step 3. Determine all vertical and horizontal asymptotes and draw them.
- Step 4. Find $f'(x)$ and determine the critical numbers and intervals of increase and decrease.
- Step 5. Determine all relative extrema. Plot each relative extrema.
- Step 6. Find $f''(x)$ and determine intervals of concavity and points of inflection. Plot inflection points.
- Step 7. Complete the sketch by joining the plotted points.

Curve Sketching

Example

Sketch the graph of the function $f(x) = xe^{-x}$.

Curve Sketching

Example

Sketch the graph of the function $f(x) = x - \ln x$ for $x > 0$.