Guidelines for Sketching a Curve

A. **Domain**: Of course!

B. **Intercepts**: (i) y-intercept: $(0, f(0))$; (ii) x-intercept: Solve the equation $f(x) = 0$. Only the real solutions. Be aware that in most of cases you will not be able to solve this equation.

C. **Symmetry**: If f is even, then we get the portion of the graph on the left hand side of y-axis for free. The same is true for an odd function. We just need to flip the portion of the graph over the x-axis and then y-axis to get the portion on the left hand side. But this feature rarely occurs.

D. **Asymptotes**: (i) Horizontal Asymptote (HA) is found by finding the limits $\lim_{x\to\infty} f(x)$ and $\lim_{x\to-\infty} f(x)$; (ii) Vertical Asymptote (VA) happens at $x = a$ when $\lim_{x\to a^{\pm}} f(x) = \pm\infty$; (iii) Slant Asymptote (SA): The function of the form $f(x)/g(x)$ has a slant asymptote $y = mx + b$ if the quotient and the remainder obtained upon dividing $f(x)$ by $g(x)$ using the long division method is mx and b respectively.

E. **Intervals of Increase or Decrease**: Use the Increasing/Decreasing test.

F. **Local Maximum and Minimum Values**: Use the first derivative test.

G. **Concavity and Points of Inflection**: Use the Concavity test.

H. **Sketch the Curve**.

Assigned Exercises: (p 321) 5, 11, 17, 21, 25, 29, 33, 67