1.
   - List any roots, their degree, and the behavior of the graph at the roots.
   - Find the y-intercept, if possible.
   - List all asymptotes, and the degree of all vertical asymptote.
   - Find any points where the graph intersects a horizontal or oblique asymptote.
   - Find the leading term and use it to determine the long term behavior.
   - Graph the function and label your axes

   (a) $f(x) = \dfrac{x^2}{(x-1)}$

   (b) $p(x) = -2x(x+2)(x-1)^2$

   (c) $h(x) = \dfrac{3x-2}{x+2}$

   (d) $g(x) = \dfrac{(x+1)^2}{(x-3)^2(x+2)}$

   (e) $p(x) = (5-x)^3(x+2)^2$

2. Simplify.

   (a) $\log_3 27^{\frac{1}{3}}$

   (b) $\log_2 8^2$

   (c) $\log_{10} 10$

   (d) $\ln e^{\frac{1}{2}}$

   (e) $3^{\log_3 10}$

   (f) Challenge Question: $\dfrac{\log_2 25}{\log_2 5}$

3. Write as a sum or difference of logarithms without any exponents.

   (a) $\log_3(x^2y^3)$

   (b) $\log_{10}\left(\frac{\sqrt{x}}{10}\right)$

   (c) $\ln(x^2-4)$

4. Write as a single logarithm

   (a) $2\ln x + \ln y$

   (b) $\frac{1}{2}(\ln x - \ln 4)$

   (c) $3\log_2 x + \log_2 y$