Section 6.3: Remainders, Section 6.4: Intro

(1) Review from Friday (You should do this from memory OR from your notes from Friday.)
   (a) If $f(x)$ has derivatives of all orders at $x = a$, then the **Taylor series** for $f(x)$ at $x = a$ is

   (b) Write the Taylor series for $y = \ln(x)$ at $x = 1$ and plug $x = 2$ into that formula.

   (c) Write the Taylor series for $f(x) = \cos(x)$ at $a = \pi/2$ and write $p_1(x)$ and $p_3(x)$, the first and third Taylor polynomials for $f(x)$.

(2) Using the definition, find the Taylor series for $g(x) = e^x$ centered at $a = 0$.

(3) A careful look at **remainders**, R_n, of Taylor series.

(4) Write $p_2(x)$, the 2nd Taylor polynomial for $g(x) = e^x$ centered at $x = 0$ and use it to estimate e. Estimate $|R_2|$ on the interval of the x-axis between the center ($a = 0$) and where we are estimating ($x = 1$).

(5) Use the Taylor series from (2) on this sheet to find (quickly) a Taylor series for $g(x) = e^{x/2}$ and $h(x) = e^{x^2}$.

(6) Observe that the Taylor series for $h(x)$ allows us to solve a very hard problem!