1. Class notes for this week: This week we have covered Sections 3.1, 3.2, and 3.3. Next week we will cover Sections 3.4 and 3.5.

2. In this question, we will show the equation $2x + \cos x = 0$ has exactly one real root.
   (a) (1 point) Let $f(x) = 2x + \cos x$. Use the Intermediate Value Theorem to show there is some $c$ such that $f(c) = 0$ in $(-\frac{\pi}{2}, 0)$. Be sure to check all hypotheses of the theorem.
   (b) (1 point) Suppose there is another number $d$ such that $f(d) = 0$. Use Rolles’ Theorem to show that there is some $e$ between $d$ and $c$ such that $f'(e) = 0$. Be sure to check all hypotheses of the theorem.
   (c) (1 point) Show that $f'(x)$ is never zero, and use this to conclude that such a $d$ cannot exist. Therefore $c$ is the only root of $2x + \cos x = 0$. 

Question 3 is on the back
3. (a) (1 point) Let \( g(x) = (x + 1)^5 - 5x - 2 \). Find
   - The intervals on which \( g \) is increasing and decreasing.
   - The local maximum and minimum values of \( g \).
   - The intervals on which \( g \) is concave up and concave down.
   - The inflection points of \( g \).

(b) (1 point) Use your answers to the first part of this problem to sketch a graph of \( g(x) \).