Read Section 2.4. Work the embedded problems.

1. Pictures of graph discontinuities

2. Definition of continuity at a point

3. Sketch the graph of a function $f(x)$ with the following properties:

    (a) the domain of $f(x)$ is the interval $[0, 10]$.
    (b) $f(x)$ is continuous except at $x = 0$ where it has in infinite discontinuity and $x = 5$ where it has a jump discontinuity.

4. Determine the point(s), if any, at which the function $h(x) = \frac{x+2}{x^2-4}$ is discontinuous. Justify your answer. Classify any discontinuity as jump, removable, infinite, or other.

5. Find the value(s) of k that makes the function continuous over the given interval.
$$f(x) = \begin{cases} e^{kx} & \text{if } 0 \le x < 4 \\ 2x+1 & \text{if } 4 \le x \le 10 \end{cases}$$

6. The Intermediate Value Theorem

   BONUS:

7. Use the Intermediate Value Theorem to show that the equation $x^4 + x - 3 = 0$ must have a solution in the interval from $x = 1$ to $x = 2$.

2-4 Continuity