1. Reading assignment for Section 1.4:
   (1) Definition 4.1-4.2.
   (2) Definition for a removable discontinuous point on Page 99 (right above Example 4.3).
   (3) Theorem 4.1-4.3.
   (4) Examples from the lecture notes.
   (5) Examples 4.4 and 4.6.

2. State the definition of a removable discontinuous point \( x = a \) of \( f(x) \).
   \( f(x) \) is not continuous at \( x = a \) but \( \lim_{x \to a} f(x) \) exists.

3. The graph of \( f(x) \) is given below.

   ![Graph of f(x)](image)

   We know that \( f(x) \) is not continuous at
   (i) \( x = -2 \)  (ii) \( x = -1 \)  (iii) \( x = 1 \) and
   (iv) \( x = 2 \).

   Determine which of these points are removable.

   \( x = -2 \), and \( x = 2 \) are removable discontinuous points.

4. Consider the function \( f(x) \) whose graph is given in Problem 6 on Page 107. We know that \( f(x) \) is not continuous at
   (i) \( x = -2 \)  (ii) \( x = 0 \) and (iii) \( x = 2 \).

   Determine which of these points are removable.

   \( x = 0 \) is a removable discontinuous point.

5. Determine the intervals (in interval notation) on which \( f(x) \) is continuous.

   Note that these function are continuous on their domains. So we first find their domains.

   (i) \( f(x) = \frac{x^2 + 1}{x^2 - 2} \),

   \[ D_f = \{ x; \ x^2 - 2 \neq 0 \} = \{ x; \ x^2 \neq \pm \sqrt{2} \} = (-\infty, -\sqrt{2}) \cup (-\sqrt{2}, \sqrt{2}) \cup (\sqrt{2}, \infty) \]
(ii) \( f(x) = \sqrt{x^2 - 4} \),
\( D_f = \{ x; x^2 - 4 \geq 0 \} = \{ x; x^2 \geq 4 \} = \{ x; |x| \geq 2 \} = \{ x; x \geq 2 \text{ or } x \leq -2 \} = (-\infty, -\sqrt{2}] \cup [\sqrt{2}, \infty) \)

(iii) \( f(x) = \ln(3 + 2x), D_f = \{ x; 3 + 2x > 0 \} = \{ x; x > -\frac{3}{2} \} \)

**Extra points:**

(iv) \( f(x) = \frac{x}{\sqrt{4 - x^2}}, D_f = \{ x; 4 - x^2 > 0 \} = \{ x; x^2 < 4 \} = \{ x; |x| < 2 \} = (-2, 2) \)

(v) \( f(x) = \ln(4 - x^2), D_f = \{ x; 4 - x^2 > 0 \} = \{ x; x^2 < 4 \} = \{ x; |x| < 2 \} = (-2, 2) \)