Continuity:

4 types of Discontinuity:

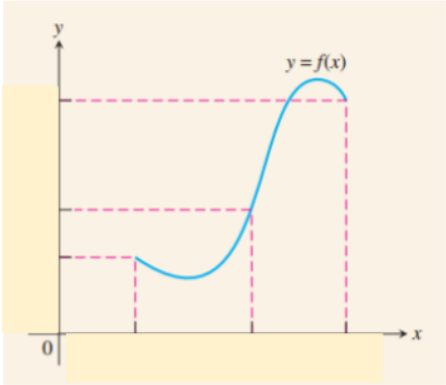
1.

2.

3.

4.

1. Find the points of discontinuity in $f(x) = \frac{x^2-2x-3}{x^2+x-12}$ and determine each type of discontinuity.

Intermediate Value Theorem for Continuous Functions: A function $y = f(x)$ that is continuous on a closed interval $[a, b]$ takes on every value between $f(a)$ and $f(b)$. In other words, if y_0 is between $f(a)$ and $f(b)$, then $y_0 = f(c)$ for some c in $[a, b]$.	

2. Let $f(x) = x^2 + 2x - 8$. Prove that there is an x-intercept from $[1, 3]$.

3. Find each point of discontinuity for the function below. Then if there are any, determine if the discontinuities are removable.

$$f(x) = \begin{cases} -2x, & \leq 2 \\ x^2 - 4x + 1, & x > 2 \end{cases}$$

4. Find the constant *a*, such that the function is continuous on the entire number line.

$$f(x) = \begin{cases} x^3, & x \leq 2 \\ ax^2, & x > 2 \end{cases}$$