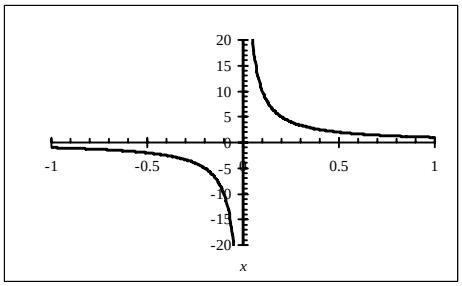
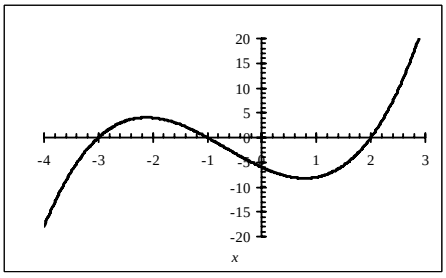
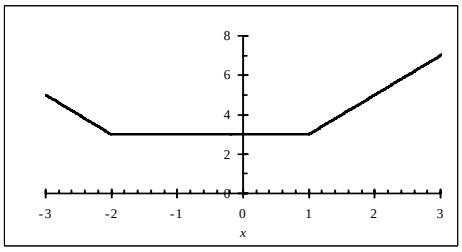
CONTINUITY

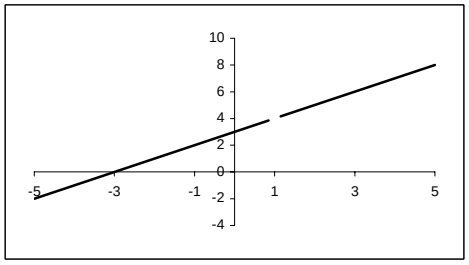
Roughly speaking, a function is said to be continuous on an interval if its graph has no breaks, jumps, or holes in that interval. So, a continuous function has a graph that can be drawn without lifting the pencil from the paper.

1. Which of the functions graphed below are continuous?









More specifically, a function is continuous if nearby values of the independent variable give nearby values of the function.

Example: Let $p(x)$ be the cost of mailing a letter weighing x ounces. According to our current postal rates, $p(1.00) = \$0.37$ and $p(0.99) = \$0.37$. But $p(1.01) = \$0.59$. So values nearby $x = 1.00$ do not give nearby values to $p(1.00)$. This function is not continuous at $x = 1.00$.

2. Which functions that we have studied so far may not be continuous?

3. Is this function continuous on the given intervals? Why or why not?

$y = \dfrac{4}{x-3}$ a. on [0,4] b. on [-2.5,2.5]

4. Is this function continuous on the given intervals? Why or why not?

$g(x) = \dfrac{e^{\cos x}}{\sin x}$ a. on $\left[\dfrac{\pi}{4}, \dfrac{3\pi}{4}\right]$ b. on $\left[\dfrac{-\pi}{4}, \dfrac{\pi}{4}\right]$