1. Consider the function

$$f(x) = 3x^2 - 5x + 5.$$

a. Is $f(x)$ continuous at $x = -2$? If the function is continuous, then evaluate $f(-2)$.

b. Does $f(x)$ have a limit at $x = -2$? If the function has a limit, then evaluate $\lim_{x \to -2} f(x)$.

2. Consider the function

$$f(x) = \frac{6}{4 + x}.$$

a. Is $f(x)$ continuous at $x = 1$? If the function is continuous, then evaluate $f(1)$.

b. Does $f(x)$ have a limit at $x = 1$? If the function has a limit, then evaluate $\lim_{x \to 1} f(x)$

3. Consider the function

$$f(x) = \frac{5}{x^2 - 1}.$$

a. Is $f(x)$ continuous at $x = 1$? If the function is continuous, then evaluate $f(1)$.

b. Does $f(x)$ have a limit at $x = 1$? If the function has a limit, then evaluate $\lim_{x \to 1} f(x)$

4. Consider the function

$$f(x) = \frac{x^2 - 11x + 24}{x - 8}.$$

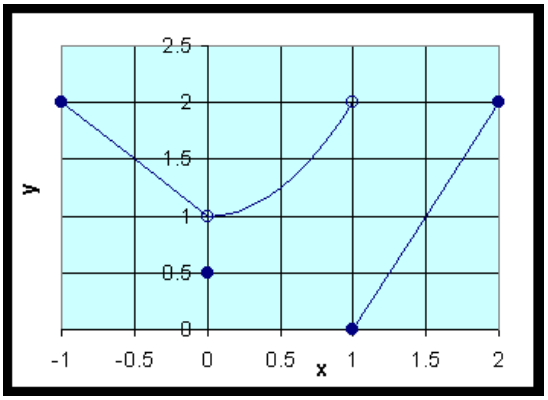
a. Is $f(x)$ continuous at $x = 8$? If the function is continuous, then evaluate $f(8)$.

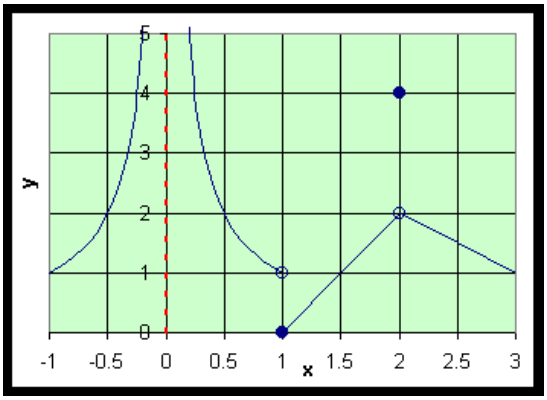
b. Does $f(x)$ have a limit at $x = 8$? If the function has a limit, then evaluate $\lim_{x \to 8} f(x)$.

5. The figure below on the left shows the graph of a function defined for $x \in [-1, 2]$.

At $x = 0$ and $x = 1$, determine what the function value is (if it exists).

Also, find the limit as $x \to 0$ and $x \to 1$, if the limits exist.





6. The figure above on the right shows the graph of a function defined for $x \in [-1, 3]$.

At $x = 0$, $x = 1$ and $x = 2$, determine what the function value is (if it exists).

Also, find the limit as $x \to 0$, $x \to 1$, and $x \to 2$ if the limits exist.

7 a. Consider $f(x) = 2x - x^2$. Evaluate the expression

$$\frac{f(x+h) - f(x)}{h}.$$

(Note that your answer should include both x and h.)

b. Take the limit as $h \to 0$ and find $f'(x)$, the derivative of $f(x)$.

8 a. Consider $f(x) = \frac{3}{x+3}$. Evaluate the expression

$$\frac{f(x+h) - f(x)}{h}.$$

(Note that your answer should include both x and h.)

b. Take the limit as $h \to 0$ and find $f'(x)$, the derivative of $f(x)$.