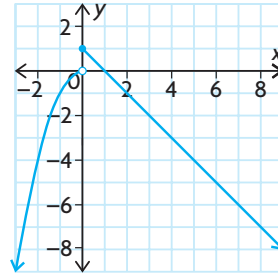


**What is a piecewise function?**

A piecewise function is a function that has two or more function rules for different parts of its domain.

For example, the function defined by  $f(x) = \begin{cases} -x^2, & \text{if } x < 0 \\ -x + 1, & \text{if } x \geq 0 \end{cases}$

consists of two pieces. The first equation defines half of a parabola that opens down when  $x < 0$ . The second equation defines a decreasing line with a  $y$ -intercept of 1 when  $x \geq 0$ . The graph confirms this.

**Show all your details work on separate sheet(s) (8½ x 11):**

1. Find the value of  $k$  that makes the following function continuous.

Graph the function.  $f(x) = \begin{cases} 2x + 1, & x \leq 2 \\ \frac{1}{2}x^2 + k, & x > 2 \end{cases}$

2. Find the value of  $k$  that makes the following function continuous.

Graph the function.  $f(x) = \begin{cases} x^2 + k, & x < 1 \\ 2(x - 2), & x \geq 1 \end{cases}$

3. Find the value of  $k$  that makes the following function continuous.

Graph the function.  $f(x) = \begin{cases} x^2 - k, & x < -1 \\ 2x - 1, & x \geq -1 \end{cases}$

4. For the piecewise function  $f(x) = \begin{cases} x^2 + k, & x < 2 \\ 2xk, & x \geq 2 \end{cases}$ , determine which value of  $k$  makes  $f(x)$

continuous.

**All MATH Course structured & Tutoring**  
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