Graphing Piecewise Functions

1. Evaluate \( f(x) = \begin{cases} x + 2 & \text{if } x < 2 \\ 2x + 1 & \text{if } x \geq 2 \end{cases} \) when:
   - a. \( x = 0 \)
   - b. \( x = 2 \)
   - c. \( x = 4 \)

2. Graph: \( f(x) = \begin{cases} x + 1 & \text{if } x < -1 \\ -x + 3 & \text{if } x \geq -1 \end{cases} \)

   Domain:
   Range:
   Point of Discontinuity:

3. Graph: \( f(x) = \begin{cases} 2x - 3 & \text{if } x > -1 \\ -2x + 1 & \text{if } x \leq -1 \end{cases} \)

   Domain:
   Range:
   Point of Discontinuity:

4. Graph: \( f(x) = \begin{cases} x & \text{if } -1 \leq x < 3 \\ x - 1 & \text{if } 3 \leq x < 5 \end{cases} \)

   Domain:
   Range:
   Point of Discontinuity:

5. Graph: \( f(x) = \begin{cases} -x & \text{if } x < -1 \\ -2 & \text{if } -1 \leq x < 2 \\ 2x & \text{if } x \geq 2 \end{cases} \)

   Domain:
   Range:
   Point of Discontinuity:

6. Graph: \( f(x) = \begin{cases} -x^2 & \text{if } x < 2 \\ x + 3 & \text{if } x \geq 2 \end{cases} \)

   Domain:
   Range:
   Point of Discontinuity:
Step Functions

7. You are making class t-shirts. A company charges $5 per shirt if you order less than 100 shirts, $4 per shirt between 100-300 shirts, and $3 per shirt for orders over 300. Write a piecewise equation to represent the situation.

8. You are making class tattoos for the pep rally. There is a $10 set up fee for the design. Tattoos cost $1 per tattoo if you order 200 or less tattoos, $0.50 per tattoo for orders over 200. Write a piecewise function to show the price based on the tattoo.

9. You start tutoring elementary students in math, and you schedule a month at a time. You charge $20 an hour for less than 3 hours, and $15 an hour for 3 or more hours. Write a piecewise function to show the rates based on the hours, and determine how much you would make if you tutored for 4 hours.

10. Graph: \( f(x) = \begin{cases} 
-3 & -5 \leq x < -3 \\
-1 & -3 \leq x < -1 \\
1 & -1 \leq x < 2 \\
3 & 2 \leq x < 5 
\end{cases} \)

11. Given the graph, determine the piecewise function (include the domain restriction):

\[ f(x) = \begin{cases} 
& \\
\end{cases} \]