Piecewise Defined Functions:

Note: There are several methods to sketch the graph of a piecewise function using your graphing calculator. Below is one of the simplest methods. So, your teacher may describe a slightly different method.

1. Draw a table for each piece of the graph.
2. Determine which *x*-values will be included in each piece and write them in the tables.
3. Find the corresponding *y*-values.
4. Determine if each transition point is a closed point (point is included) or an open point (point is not included).
5. Draw the graph.

Example 1: $f(x) = \begin{cases} x+2 & -3 \le x \le 1 \\ -2x+6 & 1 < x \le 5 \end{cases}$

1. Draw a table for each piece of the graph.
2. Determine which *x*-values will be included in each piece and write them in the tables.
3. Find the corresponding *y*-values.
   1. Type the equation in "Y=".
   2. Press "2nd", "Graph" which is the table. Scroll up and down to find the required *y*-values.

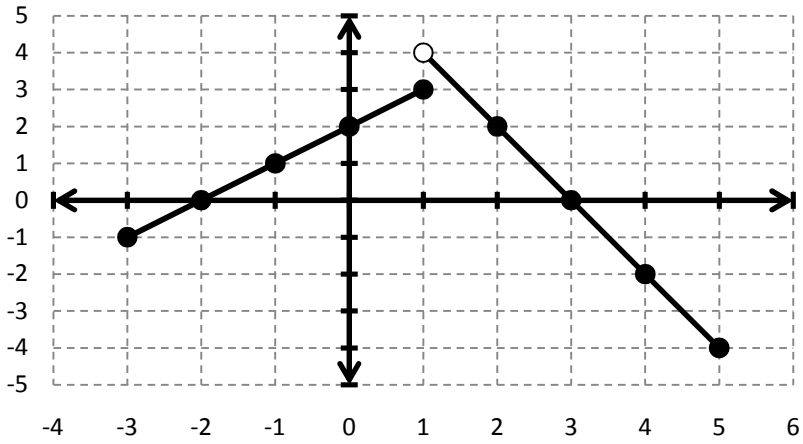
x	$f(x)$
-3	-1
-2	0
-1	1
0	2
1	3

x	$f(x)$
1	4
2	2
3	0
4	-2
5	-4

4. Determine if each transition point is a closed point (point is included) or an open point (point is not included).

   Transition Point: $x = 1$
   When $x = 1$ we follow the first piece. So, we have a closed point (solid point) on the first piece and an open point (open circle) on the second piece.

5. Draw the graph.



Example 2: $f(x) = \begin{cases} -x+4 & -4 \le x < -1 \\ -2x+3 & -1 \le x \le 2 \\ x+1 & 2 < x \le 4 \end{cases}$

1. Draw a table for each piece of the graph.
2. Determine which *x*-values will be included in each piece and write them in the tables.
3. Find the corresponding *y*-values.
   1. Type the equation in "Y=".
   2. Press "2nd", "Graph" which is the table. Scroll up and down to find the required *y*-values.

x	$f(x)$
-4	8
-3	7
-2	6
-1	5

x	$f(x)$
-1	5
0	3
1	1
2	-1

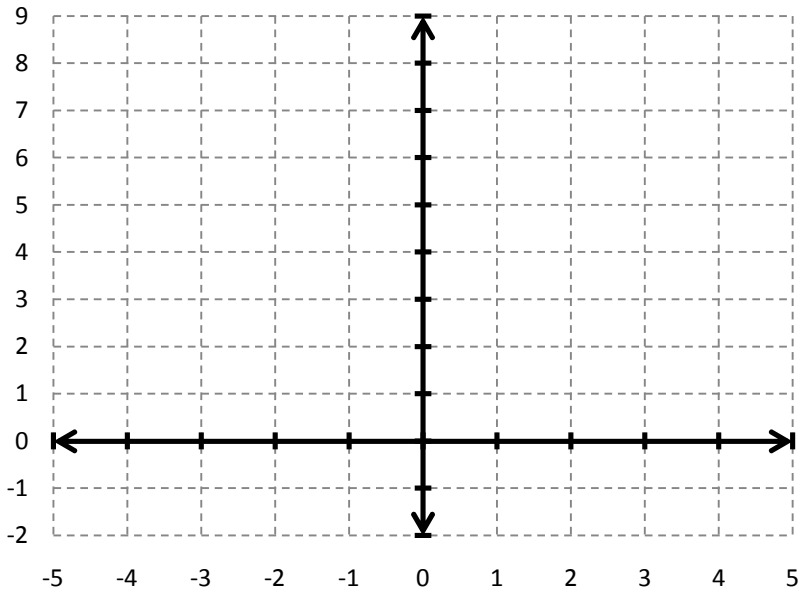
x	$f(x)$
2	3
3	4
4	5

4. Determine if each transition point is a closed point (point is included) or an open point (point is not included).

   Transition Point: $x = -1$
   When $x = -1$ we follow the second piece. So, we have a closed point (solid point) on the second piece and an open point (open circle) on the first piece. However, the two points are actually the same point so it is included (solid point).

   Transition Point: $x = 2$
   When $x = 2$ we follow the second piece. So, we have a closed point (solid point) on the second piece and an open point (open circle) on the third piece.

5. Draw the graph.



Example 2: $f(x) = \begin{cases} 2x - 1 & -2 \leq x < 1 \\ x + 2 & 1 \leq x \leq 4 \\ 6 & x > 4 \end{cases}$

1. Draw a table for each piece of the graph.
2. Determine which *x*-values will be included in each piece and write them in the tables.
3. Find the corresponding *y*-values.
   1. Type the equation in "Y=".
   2. Press "2nd", "Graph" which is the table. Scroll up and down to find the required *y*-values.

x	$f(x)$
-2	
-1	
0	
1	

x	$f(x)$
1	
2	
3	
4	

x	$f(x)$
4	
5	
6	
7	

4. Determine if each transition point is a closed point (point is included) or an open point (point is not included).

   Transition Point: $x =$

   Transition Point: $x =$

5. Draw the graph.