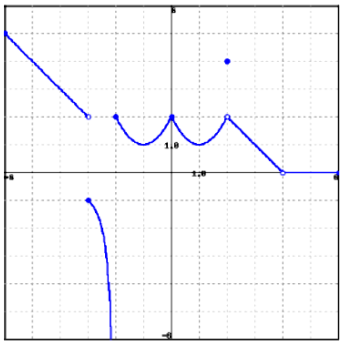
Quiz 3.5 – Piecewise Functions

1. **(1 point) —alfredLibrary/AUCI/chapter3/lesson5/quiz/question2.pg—** At which of the following could a function fail to be differentiable? There may be more than one correct answer, so check all that apply.

- A. A corner.
- B. A vertical tangent.
- C. A jump.
- D. A hole.

2. **(1 point) —alfredLibrary/AUCI/chapter3/lesson5/quiz/question2pet.pg—**



(a) Recall, a function is not continuous at a point if its graph has a break, jump, or hole at that point. Use the graph above to find the x-values for which the function is NOT continuous. Enter your answer as a comma-separated list: $x =$ _____

(b) Recall, a function is not differentiable at a point if it is not continuous at that point, or if its graph has a sharp change in direction or an infinite slope at that point. Use the graph above to find the x-values for which the function is NOT differentiable. Enter your answer as a comma-separated list: $x =$ _____

Note: *You can click on the graph to enlarge the image.*

3. **(1 point) —alfredLibrary/AUCI/chapter3/lesson5/quiz/limits88pet.pg**

Let $f(x) = \begin{cases} 4x-3, & \text{if } x \le 3 \\ -7x+b, & \text{if } x > 3 \end{cases}$

Find the correct value of b that makes the function $f(x)$ continuous everywhere:

$b =$_____

(HINT: The two pieces of the graph must connect at $x = 3$.)

Now for fun, try to graph $f(x)$.

4. **(1 point) —alfredLibrary/AUCI/chapter3/lesson5/quiz/limits99pet.pg**

Let $f(x) = \begin{cases} x^2-4x+3, & \text{if } x \le -2 \\ ax+b, & \text{if } x > -2 \end{cases}$

Find a and b such that the function $f(x)$ is differentiable everywhere.

$a =$ _____
$b =$ _____

(HINT: First use differentiability to find a. Then use continuity to find b.)