Desmos Limits Activity

Name:_____

Period:

Go to https://teacher.desmos.com/activitybuilder/custom/574de5cdab71b5085a2aad42 and do the activity.

1) Watch this dot as it moves along the function $y = f(x)$. What y-value is the dot getting closer to as x approaches 1 from the left side?

2) Watch this dot as it moves along the function $y = f(x)$. What y-value is the dot getting closer to as x approaches 1 from the right side?

3) Now look carefully at the function. What is the actual value of y when $x = 1$?

4) Explain what these statements mean:

   a) $\lim\limits_{x \to 1^-} f(x) = 2$

   b) $\lim\limits_{x \to 1^+} f(x) = 3$

   c) $f(1) = 0.5$

5) Is the function shown here continuous at $x = 1$? Explain.

6) (a) What y-value is the function approaching as x approaches 3 from the left?

   (b) What y-value is the function approaching as x approaches 3 from the right?

   (c) What (if any) is the actual y-value at $x = 3$?

7) Is the function shown here continuous at $x = 3$? Explain.

8) Change the graph (by dragging one of the movable points) to create a function that is continuous at $x = 3$. Draw your sketch below.

9) Sketch a function that approaches two different points as x approaches -4.
   (a) What y-value is it approaching from the left?

   (b) What y-value is it approaching from the right?

   (c) What (if any) is its actual y-value at that point?

   (d) Is your graph continuous at $x = -4$?

10) As x approaches 0, the left and right limits equal 3. However, the actual y-value at that point is -3. Is the function continuous at $x = 0$? Explain.

11) Sketch a function that is <u>discontinuous</u> at $x = 2$.

12) Which of the functions are continuous for all x-values?