Chapter 1, Section 2: Preview Activity

Preview Activity 1.2.1. Suppose that g is the function given by the graph below. Use the graph in Figure 1.2.1 to answer each of the following questions.

a. Determine the values $g(-2)$, $g(-1)$, $g(0)$, $g(1)$, and $g(2)$, if defined. If the function value is not defined, explain what feature of the graph tells you this.

b. For each of the values $a = -1$, $a = 0$, and $a = 2$, complete the following sentence: "As x gets closer and closer (but not equal) to a, $g(x)$ gets as close as we want to _____."

c. What happens as x gets closer and closer (but not equal) to $a = 1$? Does the function $g(x)$ get as close as we would like to a single value?
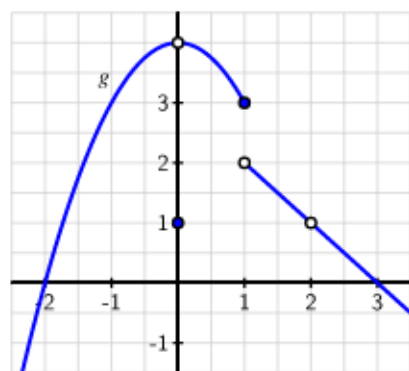

Figure 1.2.1. Graph of $y = g(x)$ for Preview Activity 1.2.1.

a. Determine the values g(−2), g(−1), g(0), g(1), and g(2), if defined. If the function value is not defined, explain what feature of the graph tells you this.

```
In[145]:= g[t_] :=
     If[t == 0, 1,
       If[t ≤ 1, 4 - t^2,
         If[t ≠ 2, 3 - t]
       ]
     ]
   p1 = Plot[g[t], {t, -2.3, 3.5}, PlotStyle → {Thickness[0.005]}];
   p2 = ListPlot[{{0, 4}, {1, 2}, {2, 1}}, PlotStyle → Large, PlotMarkers → {O}];
   p3 = ListPlot[{{0, 1}, {1, 3}}, PlotStyle → Large];
   Show[p1, p2, p3, PlotLabel → "Discontinuous Function of Preview 1.2.1",
     AxesLabel → {"t", "y"}, AspectRatio → 1]
```
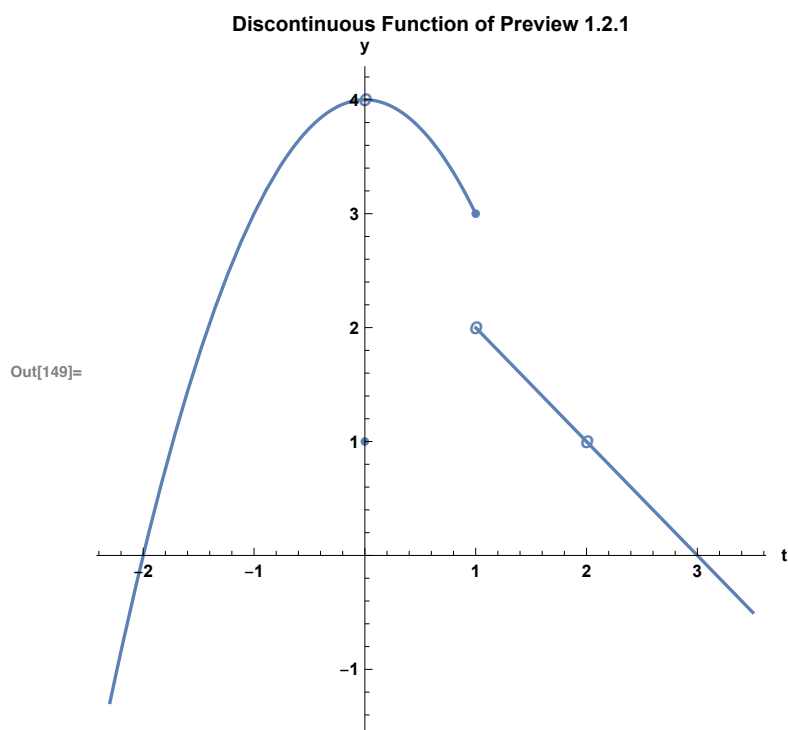
Out[149]=

Discontinuous Function of Preview 1.2.1

b) For each of the values a = −1, a = 0, and a = 2, complete the following sentence : "As x gets closer and closer (but

not equal) to a, g (x) gets as close as we want to_____."

a=-1: g(-1)=3

a=0: 4

a=2: 1

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c. What happens as x gets closer and closer (but not equal) to a=1? Does the function g(x) get as close as we would like to a single value?

No: it's split. On the left of a=1, it's approaching 3; on the right, it's approaching 2.