Limits

1. Consider $f(x) = \dfrac{2x^2 + 4x}{x + 2}$.

   (a) Fill in the following table:

x	-1	-1.9	-1.99	-2	-2.01	-2.1	-3
f(x)							

   (b) Use the data above to find $\lim\limits_{x \to -2} f(x)$.

   (c) Draw the graph of f on the axis below and verify your answer.
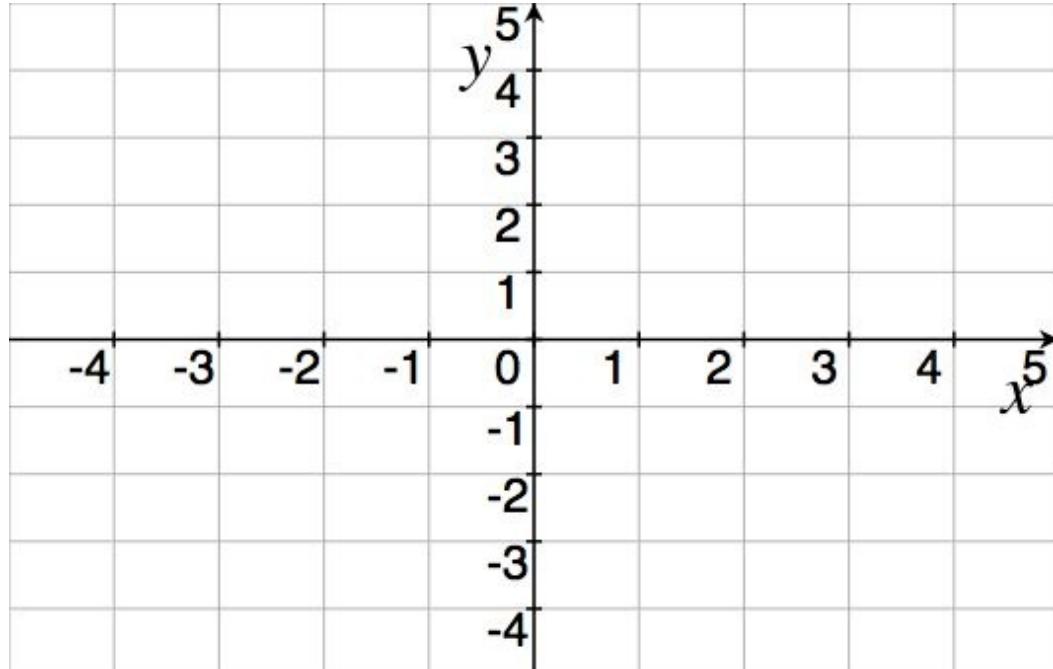
2. Let g be the piece-wise defined function below. This means the graph of g is the *entire* dotted graph shown below.
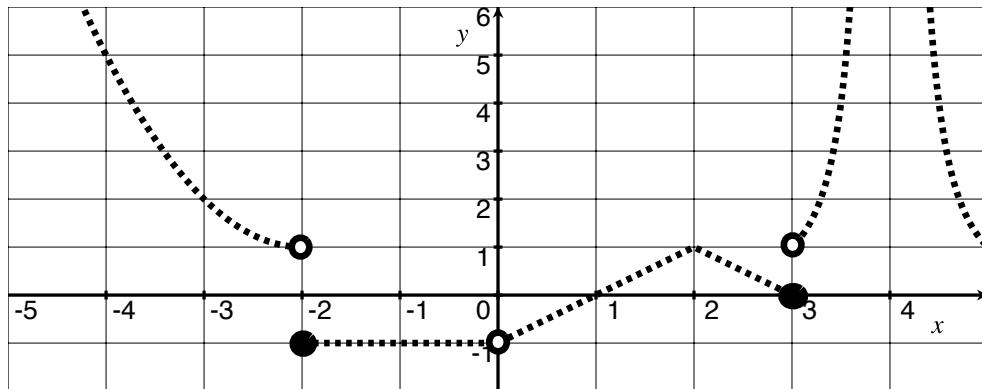
(a) Find the following *if* it exits:

$$\lim_{x\to 1} g(x) \qquad\qquad \lim_{x\to 0} g(x) \qquad\qquad \lim_{x\to 3} g(x)$$

$$\lim_{x\to 2} g(x) \qquad\qquad \lim_{x\to -2} g(x) \qquad\qquad \lim_{x\to -3} g(x)$$

3. Sketch a graph of a function α that satisfies *all* of the following:

$$\alpha(-1) = 2. \qquad \lim_{x\to -1} \alpha(x) = -3, \qquad \lim_{x\to 2} \alpha(x) = -3, \qquad \text{and the } \lim_{x\to 4} \alpha(x) \text{ does not exist.}$$