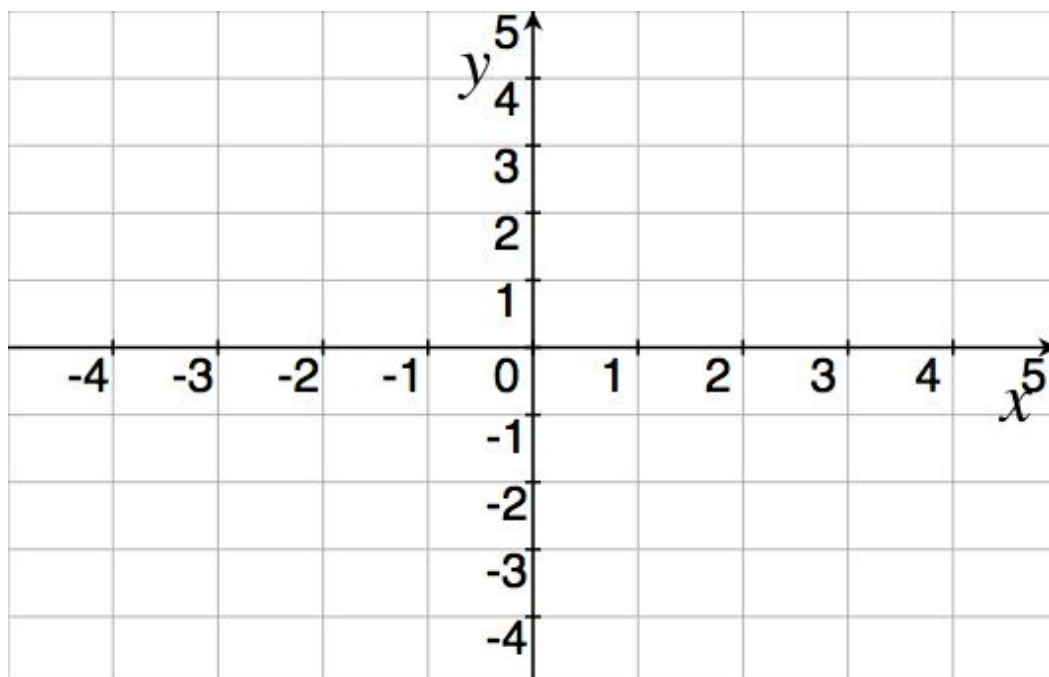# Continuity

1. Consider the piecewise-defined function

$$f(x) = \begin{cases} \dfrac{(x+3)(x+4)}{x+4} & \text{if } x < -2 \\ 1 & \text{if } -2 \le x \le 0 \\ -1 + \log_2 x & \text{if } 0 < x \end{cases}$$

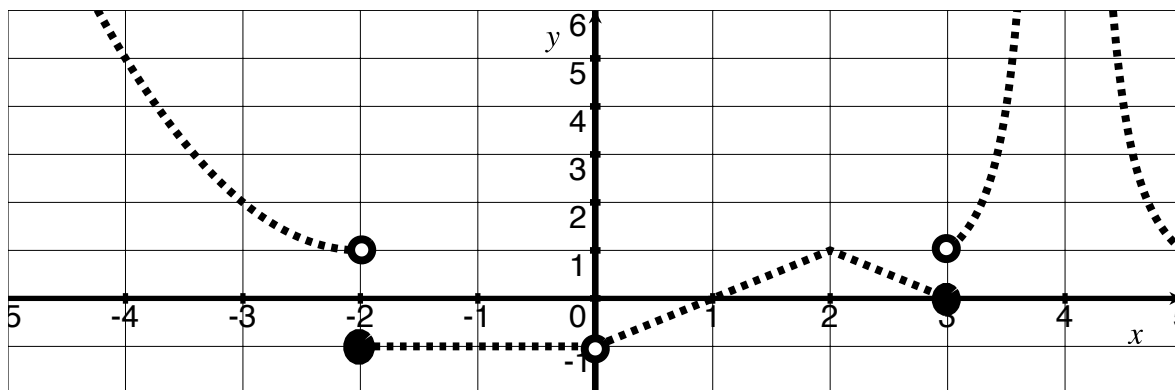(a) Draw the graph of f on the axis below.

2. Find $\lim\limits_{x \to -2} f(x)$ either numerically or graphically.

3. Find $f(-2)$

4. Is f continuous at $x = -2$?

5. Let g be the piece-wise defined function below. This means the graph of g is the *entire* dotted graph shown below.

(a) Is g continuous at:

$x = 0$ $x = 2$ $x = 3$?

(b) Find all the x coordinates where g is discontinuous.

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

$\alpha(-1) = -3$, $\lim\limits_{x \to -1^+} \alpha(x) = 2$, α is continuous on $(0,3)$,   and not continuous at $x = 4$.