

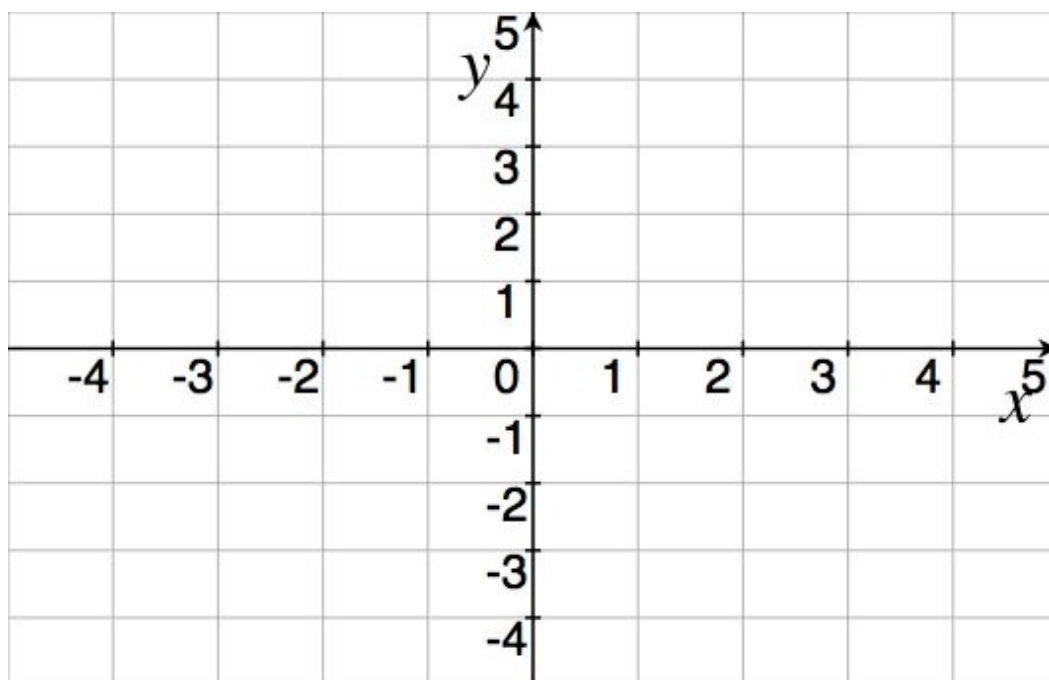
Continuity

Note: a personal copy of this worksheet may be used during the quiz next Tuesday.

1. Consider the piecewise-defined function

$$f(x) = \begin{cases} x^2 - 3 & \text{if } -1 \leq x \\ \frac{2x^2 + 2x}{x + 1} & \text{if } x < -1 \end{cases}$$

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

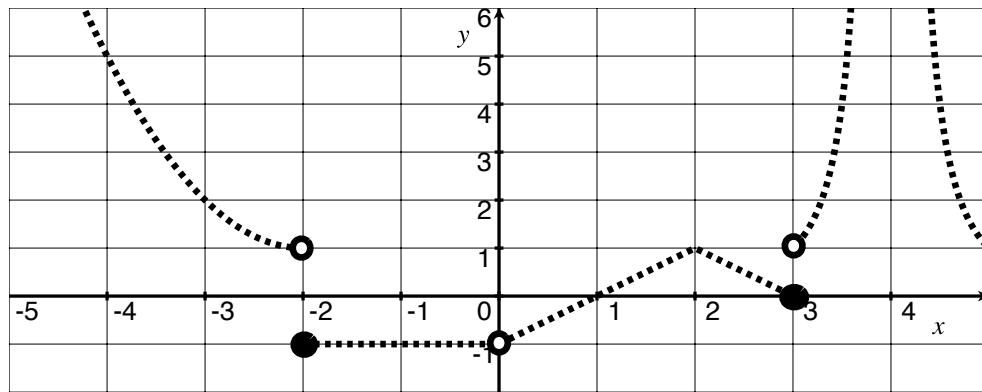


2. Find $\lim_{x \rightarrow -1} f(x)$ either numerically or graphically.

3. Find $f(-1)$

4. Is f continuous at $x = -1$?

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 points that g is discontinuous.

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

$$\alpha(-1) = -3, \quad \lim_{x \rightarrow -1} \alpha(x) = 2, \quad \alpha \text{ is continuous on } (0, 3), \quad \text{and not continuous at } x = 4.$$

