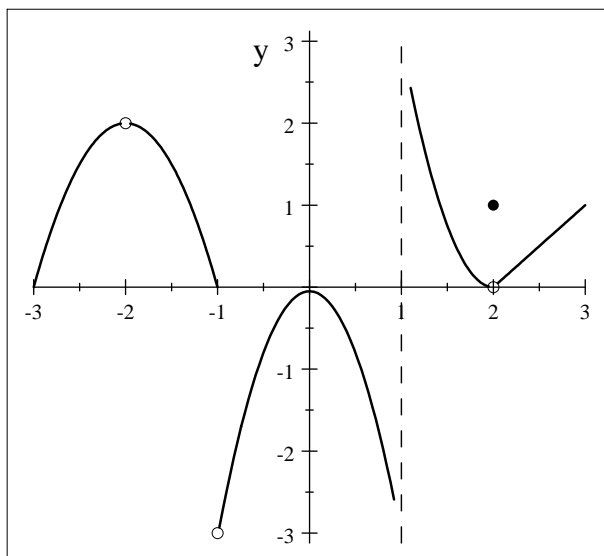


Show your work in details and provide reasons to support your answers.

1. (4pts) (1) State the definition of **continuity** of a function  $f(x)$  at  $x = a$ .

(2) Let  $x = b$  be a discontinuous point of  $f(x)$ . Under what condition,  $x = b$  is a removable discontinuous point?

2. (6pts) The graph of  $f(x)$  is given below. Graphically, we know  $f(x)$  is not continuous at  $x = -2$ ,  $x = -1$ ,  $x = 1$  and  $x = 2$ . For each of these 4 discontinuities,  
 (1) specify a **continuity condition** (given in the definition of continuity) that fails to satisfy;  
 (2) determine if it is a removable discontinuity.



$y = f(x)$

a. $x = -2$
b. $x = -1$
c. $x = 1$
d. $x = 2$

3. (5pts) Determine algebraically (without using calculator) the intervals (**in interval notation**) on which  $f(x)$  is continuous.

a.  $f(x) = \frac{x^2 + 1}{x^2 - 4}$

b.  $f(x) = \ln(3x + 2)$