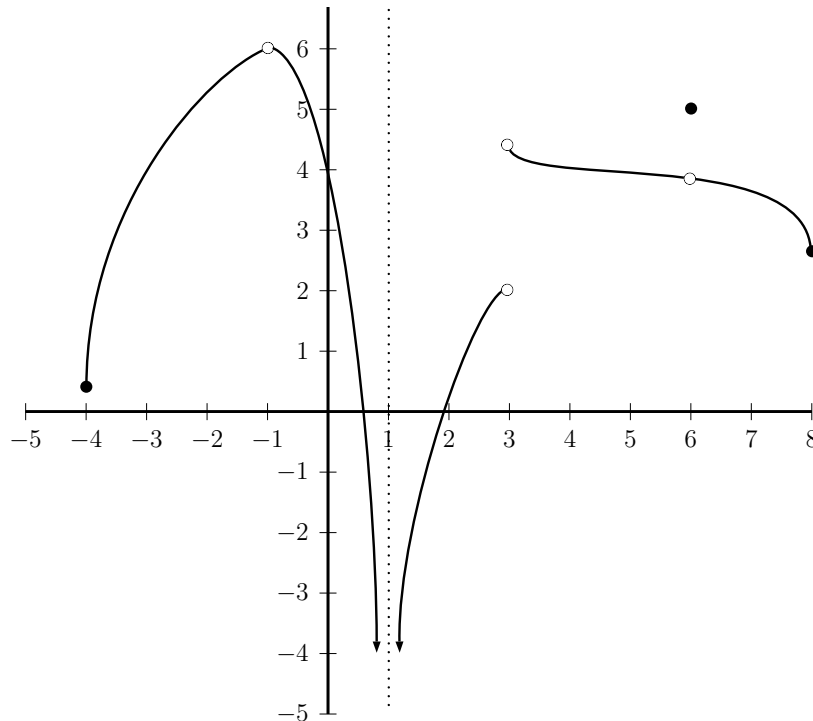


# Math 2215 - Calculus 1

Quiz #5 - 2017.09.05

Solutions

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Above is the graph of a function  $f(x)$ . Use this graph to answer the following questions.

1. State the domain of  $f(x)$ .

The domain is  $[-4, -1) \cup (-1, 1) \cup (1, 3) \cup (3, 8]$

2. At what points  $a$  in the domain does  $\lim_{x \rightarrow a} f(x)$  not exist?

The limit does not exist at  $x = -4$  since the function does not exist for  $x < -4$ .

The limit does not exist at  $x = 1$  since the limit tends to  $-\infty$ .

The limit does not exist at  $x = 3$  since the left and right limits do not agree.

The limit does not exist at  $x = 8$  since the function does not exist for  $x > 8$ .

3. At what points  $a$  in the domain does  $\lim_{x \rightarrow a^-} f(x)$  not exist?

The left-hand limit does not exist at  $x = -4$  since the function does not exist for  $x < -4$ .

The left-hand limit does not exist at  $x = 1$  since the limit tends to  $-\infty$ .

4. At what points  $a$  in the domain does  $\lim_{x \rightarrow a^+} f(x)$  not exist?

The right-hand limit does not exist at  $x = 1$  since the limit tends to  $-\infty$ .

The right-hand limit does not exist at  $x = 8$  since the function does not exist for  $x > 8$ .

5. At what points  $a$  in the domain is  $f(x)$  not continuous?

The function is not continuous at  $x = -1$ ,  $x = 1$ ,  $x = 3$ , and  $x = 6$ . The function is continuous at the endpoints due to the definition of being continuous at an endpoint.