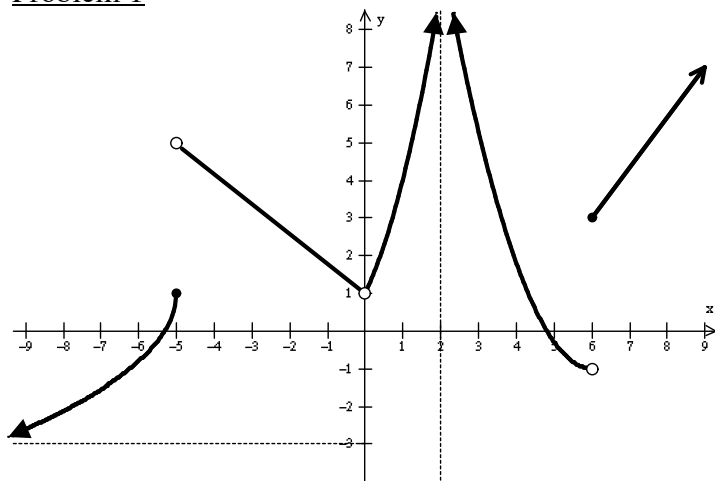


**AP Calculus Practice Problems**  
**Chapter 1.2**  
**Graphically Determining Limits**

Evaluate the given limits and determine the domain and range for each function.

**Problem 1**

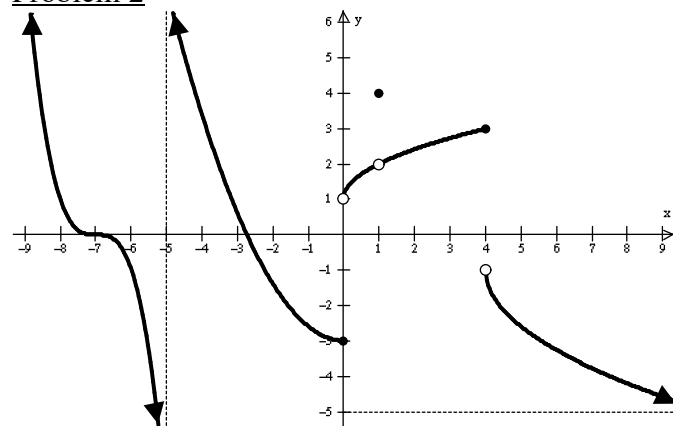


$$\lim_{x \rightarrow 5^-} f(x) = \quad \lim_{x \rightarrow 0^-} f(x) = \quad \lim_{x \rightarrow 2^-} f(x) = \quad \lim_{x \rightarrow 6^-} f(x) = \quad \lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow 5^+} f(x) = \quad \lim_{x \rightarrow 0^+} f(x) = \quad \lim_{x \rightarrow 2^+} f(x) = \quad \lim_{x \rightarrow 6^+} f(x) = \quad \lim_{x \rightarrow \infty} f(x) =$$

$$\lim_{x \rightarrow 5} f(x) = \quad \lim_{x \rightarrow 0} f(x) = \quad \lim_{x \rightarrow 2} f(x) = \quad \lim_{x \rightarrow 6} f(x) =$$

**Problem 2**



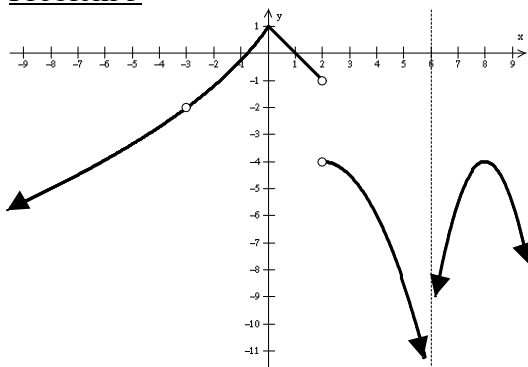
$$\lim_{x \rightarrow 5^-} f(x) = \quad \lim_{x \rightarrow 0^-} f(x) = \quad \lim_{x \rightarrow 1^-} f(x) = \quad \lim_{x \rightarrow 4^-} f(x) = \quad \lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow 5^+} f(x) = \quad \lim_{x \rightarrow 0^+} f(x) = \quad \lim_{x \rightarrow 1^+} f(x) = \quad \lim_{x \rightarrow 4^+} f(x) = \quad \lim_{x \rightarrow \infty} f(x) =$$

$$\lim_{x \rightarrow 5} f(x) = \quad \lim_{x \rightarrow 0} f(x) = \quad \lim_{x \rightarrow 1} f(x) = \quad \lim_{x \rightarrow 4} f(x) =$$

**AP Calculus Practice Problems**  
**Chapter 1.2**  
**Graphically Determining Limits**

**Problem 3**



$$\lim_{x \rightarrow -3^-} f(x) = \lim_{x \rightarrow 0^-} f(x) =$$

$$\lim_{x \rightarrow 2^-} f(x) =$$

$$\lim_{x \rightarrow 6^-} f(x) = \lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow -3^+} f(x) = \lim_{x \rightarrow 0^+} f(x) =$$

$$\lim_{x \rightarrow 2^+} f(x) =$$

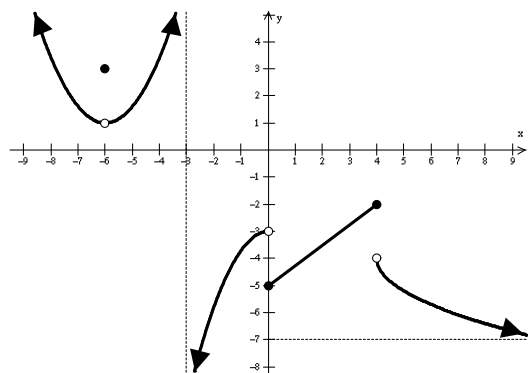
$$\lim_{x \rightarrow 6^+} f(x) = \lim_{x \rightarrow \infty} f(x) =$$

$$\lim_{x \rightarrow -3} f(x) = \lim_{x \rightarrow 0} f(x) =$$

$$\lim_{x \rightarrow 2} f(x) =$$

$$\lim_{x \rightarrow 6} f(x) =$$

**Problem 4**



$$\lim_{x \rightarrow -6^-} f(x) = \lim_{x \rightarrow -3^-} f(x) =$$

$$\lim_{x \rightarrow 0^-} f(x) =$$

$$\lim_{x \rightarrow 4^-} f(x) = \lim_{x \rightarrow -\infty} f(x) =$$

$$\lim_{x \rightarrow -6^+} f(x) = \lim_{x \rightarrow -3^+} f(x) =$$

$$\lim_{x \rightarrow 0^+} f(x) =$$

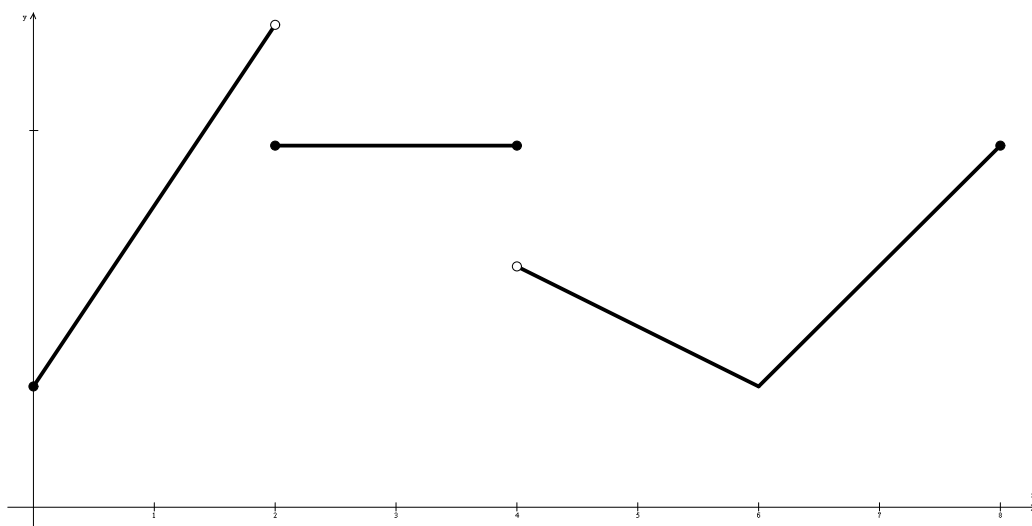
$$\lim_{x \rightarrow 4^+} f(x) = \lim_{x \rightarrow \infty} f(x) =$$

$$\lim_{x \rightarrow -6} f(x) = \lim_{x \rightarrow -3} f(x) =$$

$$\lim_{x \rightarrow 0} f(x) =$$

$$\lim_{x \rightarrow 4} f(x) =$$

**AP Calculus Practice Problems**  
**Chapter 1.2**  
**Graphically Determining Limits**

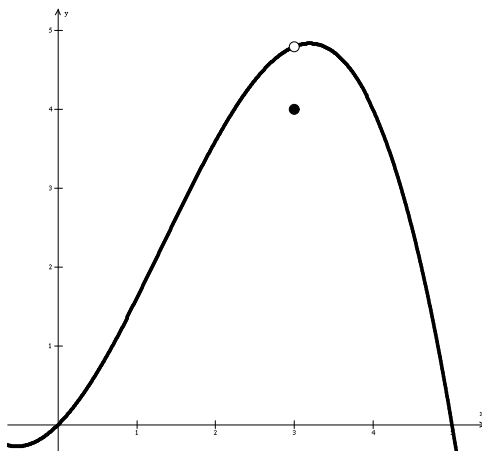


5. The figure above shows the graph of a function  $f$  with domain  $0 \leq x \leq 8$ . Which of the following statements are true?

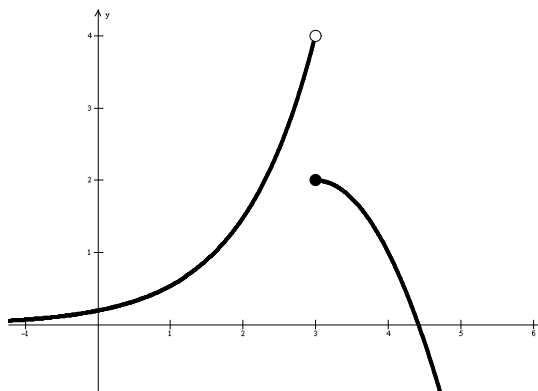
- |  |  |  |
|--|--|--|
| I. $\lim_{x \rightarrow 2^-} f(x)$ exists  | IV. $\lim_{x \rightarrow 4^-} f(x)$ exists | VII. $\lim_{x \rightarrow 6^-} f(x)$ exists  |
| II. $\lim_{x \rightarrow 2^+} f(x)$ exists | V. $\lim_{x \rightarrow 4^+} f(x)$ exists  | VIII. $\lim_{x \rightarrow 6^+} f(x)$ exists |
| III. $\lim_{x \rightarrow 2} f(x)$ exists  | VI. $\lim_{x \rightarrow 4} f(x)$ exists   | IX. $\lim_{x \rightarrow 6} f(x)$ exists     |

6. For which of the following does  $\lim_{x \rightarrow 3} g(x)$  exist?

I.



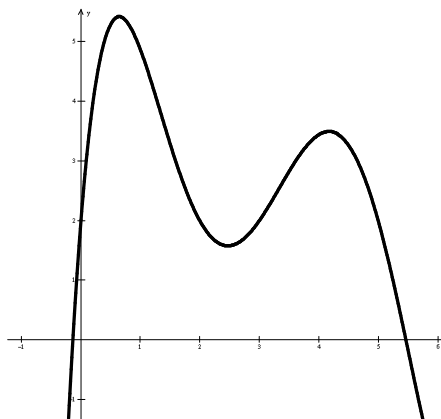
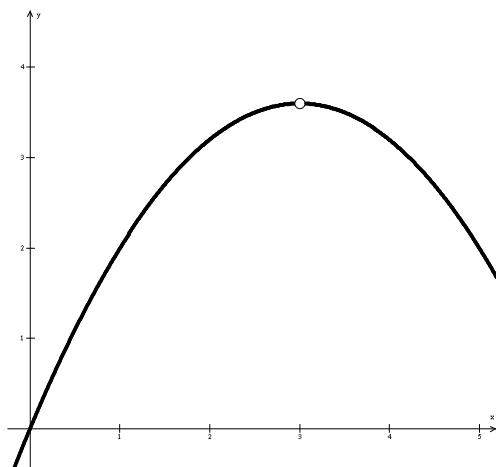
II.



III.

IV.

**AP Calculus Practice Problems**  
**Chapter 1.2**  
**Graphically Determining Limits**



7. Graph a sketch of a function,  $f$ , that has the following characteristics.

$$\lim_{x \rightarrow 1^-} f(x) = 2$$

$$\lim_{x \rightarrow 4} f(x) = 5$$

$$\lim_{x \rightarrow \infty} f(x) = -\infty$$

$$\lim_{x \rightarrow 1^+} f(x) = 3$$

$$f(4) = 1$$

$$\lim_{x \rightarrow -\infty} f(x) = \infty$$

$$\lim_{x \rightarrow 1} f(x) \text{ does not exist}$$

$$f(1) = 2$$

8. Graph a sketch of a function,  $g$ , that has the following characteristics.

$$\lim_{x \rightarrow 3^-} g(x) = \infty$$

$$\lim_{x \rightarrow 5} g(x) = 2$$

$$\lim_{x \rightarrow \infty} g(x) = 4$$

$$\lim_{x \rightarrow 3^+} g(x) = -\infty$$

$$g(5) = 1$$

$$\lim_{x \rightarrow -\infty} g(x) = -\infty$$

$$\lim_{x \rightarrow 3} g(x) \text{ does not exist}$$

9. Graph a sketch of a function,  $h$ , that has the following characteristics.

$$\lim_{x \rightarrow 2^-} h(x) = -1$$

$$\lim_{x \rightarrow -3^-} h(x) = -\infty$$

$$\lim_{x \rightarrow \infty} h(x) = \infty$$

$$\lim_{x \rightarrow 2^+} h(x) = 0$$

$$\lim_{x \rightarrow -3^+} h(x) = \infty$$

$$\lim_{x \rightarrow -\infty} h(x) = 0$$

$$\lim_{x \rightarrow 2} h(x) \text{ does not exist}$$

$$\lim_{x \rightarrow -3} h(x) \text{ does not exist}$$

$$h(2) = 0$$

For problems 10-14, determine if each statement **must be true**, **could be false**, or **must be false**.

10. If  $\lim_{x \rightarrow \infty} f(x) = 2$ , then the graph of  $f$  has at least one horizontal asymptote.

## AP Calculus Practice Problems

### Chapter 1.2

#### Graphically Determining Limits

11. If  $\lim_{x \rightarrow 0^-} f(x)$  exists and  $\lim_{x \rightarrow 0^+} f(x)$  exists, then  $\lim_{x \rightarrow 0} f(x)$  exists.

12. If  $\lim_{x \rightarrow 2} f(x) = 1$ , then  $\lim_{x \rightarrow 2^-} f(x) = 1$  and  $\lim_{x \rightarrow 2^+} f(x) = 1$

13. If the graph of  $f$  has two distinct horizontal asymptotes, then  $\lim_{x \rightarrow \infty} f(x) = \lim_{x \rightarrow -\infty} f(x)$

14. If  $\lim_{x \rightarrow 1^-} f(x) = \infty$ , then  $\lim_{x \rightarrow 1^+} f(x) = -\infty$