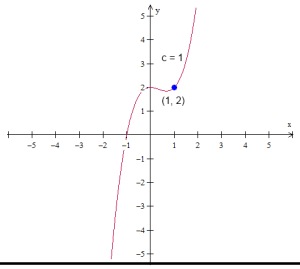
Continuity and One-Sided Limits

1. Use the graph to determine the limit, and discuss the continuity of the function (similar to p.98 #1-6)

$(a)\lim_{x\to c^+} f(x) \quad (b)\lim_{x\to c^-} f(x) \quad (c)\lim_{x\to c} f(x)$



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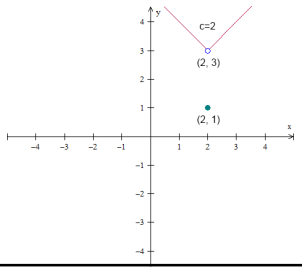

3. Find the limit (if it exists). If it does not exist, explain why (similar to p.99 #7-30)

$$\lim_{x\to 3^-} \frac{-2}{x+3}$$

4. Find the limit (if it exists). If it does not exist, explain why (similar to p.99 #7-30)

$$\lim_{x\to 5^+} \frac{5-x}{x^2-25}$$

5. Find the limit (if it exists). If it does not exist, explain why (similar to p.99 #7-30)

$$\lim_{x\to 4^-} \frac{\sqrt{x}-2}{x-4}$$

6. Find the limit (if it exists). If it does not exist, explain why
(similar to p.99 #7-30)

$$\lim_{x\to 3} f(x) \text{ where } f(x)=\begin{cases} x^2-5x+1, & x\le 3 \\ -x^2+4x-8, & x>3 \end{cases}$$

7. Find the limit (if it exists). If it does not exist, explain why
(similar to p.99 #7-30)

$$\lim_{x\to \pi/2} \tan x$$

8. Find the limit (if it exists). If it does not exist, explain why
(similar to p.99 #7-30)

$$\lim_{x\to 3^-} \ln(3-x)$$

9. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable?
(similar to p.99 #39-66)

$$f(x)=\frac{5}{x-4}$$

10. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable?
(similar to p.99 #39-66)

$$f(x)=x^2+3x+5$$

11. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable?
(similar to p.99 #39-66)

$$f(x)=\frac{2}{x^2+3}$$

12. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable? (similar to p.99 #39-66)

$$f(x) = 5x + \sin x$$

13. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable? (similar to p.99 #39-66)

$$f(x) = \frac{x+4}{x^2 - 16}$$

14. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable? (similar to p.99 #39-66)

$$f(x) = \begin{cases} 3x - 5, & x < 2 \\ x^2 - 3, & x \geq 2 \end{cases}$$

15. Find the x-values (if any) at which f is not continuous. Which of the discontinuities are removable? (similar to p.99 #39-66)

$$f(x) = \begin{cases} 7x + 3, & x < 1 \\ x^2 + 4, & x \geq 1 \end{cases}$$