

## 11.3 More on Limits

Target 9C: Evaluate a limit of a function graphically

Target 9D: Calculate one-sided limits and two-sided limits

Review of Prior Concepts

Given  $\lim_{x \rightarrow 3} f(x) = 2$  and  $\lim_{x \rightarrow 3} g(x) = -1$ , find:

a)  $\lim_{x \rightarrow 3} (2f(x) + g(x))$

b)  $\lim_{x \rightarrow 3} \frac{(g(x))^2}{f(x)-4}$

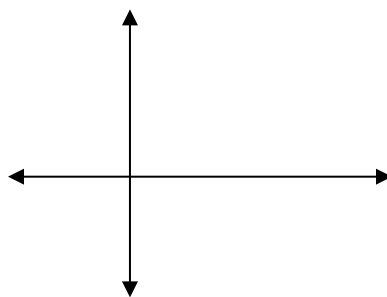
## More Practice

## Limits Analytically

<http://www.ck12.org/book/CK-12-Precalculus-Concepts/section/14.4/><http://www.ck12.org/book/CK-12-Precalculus-Concepts/section/14.5/><http://precalculus.flippedmath.com/151-limits-analytically.html><http://www.barrington220.org/cms/lib8/IL01001296/Centricity/Domain/321/1.3%20D1%20Ans.pdf><https://youtu.be/-gjURkNuh9o><https://youtu.be/MspCIN-r8C0>

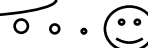
## Finding Limits Graphically

$$\lim_{x \rightarrow c} f(x) = L$$

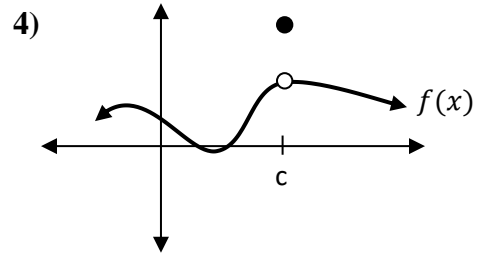
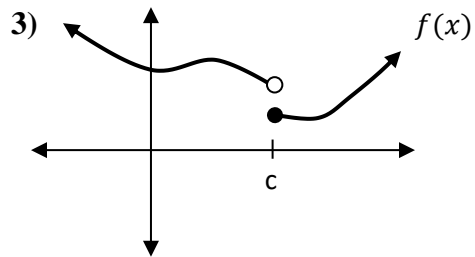
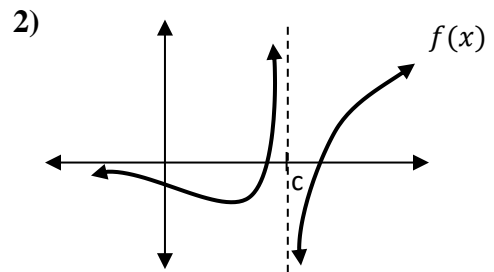
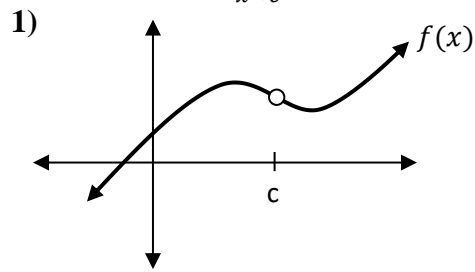
In order for  $\lim_{x \rightarrow c} f(x)$  to exist,

$$\lim_{x \rightarrow c^-} f(x) \text{ has to equal } \lim_{x \rightarrow c^+} f(x)$$

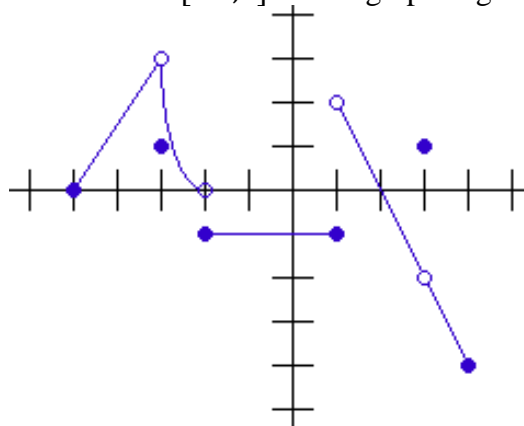
"limit from the left = limit from the right"



Examples: Does  $\lim_{x \rightarrow c} f(x)$  exist? Explain why or why not.



Let  $g$  be a function defined on the interval  $[-5, 4]$  whose graph is given as:



Using the graph, find the following limits if they exist, and, if not, explain why not.

1)  $\lim_{x \rightarrow 3} g(x)$

6)  $\lim_{x \rightarrow 1} g(x)$

2)  $\lim_{x \rightarrow 0} g(x)$

7)  $\lim_{x \rightarrow -2^-} g(x)$

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

8)  $\lim_{x \rightarrow 4} g(x)$

4)  $\lim_{x \rightarrow 1^+} g(x)$

9)  $\lim_{x \rightarrow 2} g(x)$

5)  $\lim_{x \rightarrow 1^-} g(x)$

10)  $\lim_{x \rightarrow -2^+} g(x)$

## More Practice

### Limits Graphically

<http://www.coolmath.com/precalculus-review-calculus-intro/precalculus-algebra/21-rational-functions-limits-infinity-right-left-01>

<https://www.khanacademy.org/math/ap-calculus-ab/limits-basics-ab/limits-from-graphs-ab/v/limits-from-graphs-undefined>

<http://precalculus.flippedmath.com/23-limits-graphically.html>

<http://philschatz.com/precalculus-book/contents/m49452.html>

<http://www.mathsisfun.com/calculus/limits.html>

<https://youtu.be/IklVRSonvFQ>

<https://youtu.be/UkjgJQaGx98>

[https://youtu.be/XOu\\_LFGai0A](https://youtu.be/XOu_LFGai0A)

## Homework Assignment

p.781 #27–33odd, 37–45odd