STEM

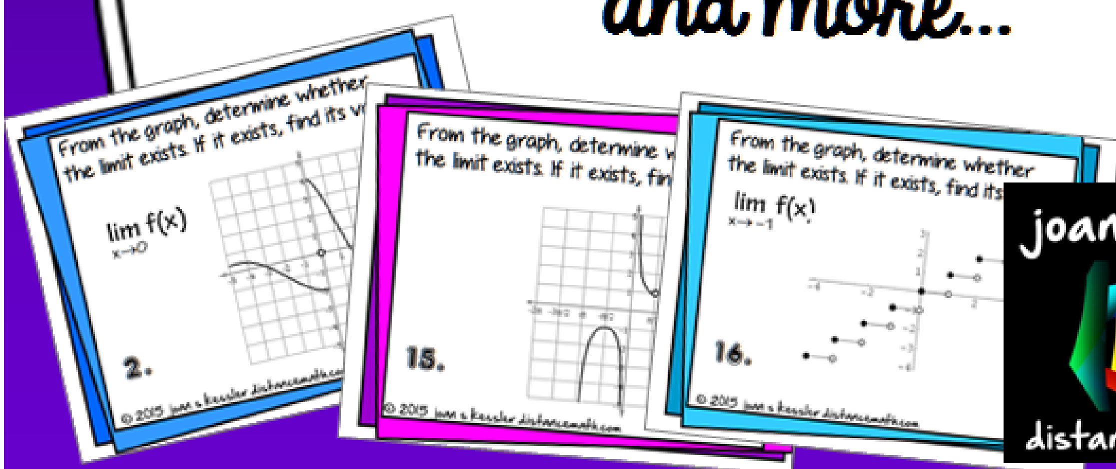
Science • Technology • Engineering • Math

CALCULUS UNIT 1

LIMITS FROM GRAPHS

Task Cards

plus notes, quiz, and more...



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A Note For You

Please visit my store often to find high quality, innovative products for Calculus, PreCalculus, Trigonometry, Statistics, and Algebra. You will find PowerPoint Lessons, Task Cards, Games, Guided Notes, Interactive Notebook pages, Teach Interactive™ Google Slide and digital products, and so much more. I strive to create student centered., teacher friendly resources to implement into your classroom.

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Product Description

This activity is designed for Calculus 1, AP Calculus AB, and PreCalculus for some curricula.

Included:

* **Guided student notes with four examples.** There are two versions, one completed and one left for the students to complete with you in class.

* **Task Cards:** There are **24 Task Cards** with mostly piecewise continuous functions. Students are to determine the limits, if they exist, from analyzing the graph. My students found the visual aspect of learning limits very helpful. They do not have to identify the functions but that in itself is a goal of mine, to have them identify and possibly duplicate the functions on their graphing calculators. Understanding of this section will help with continuity.

***Student recording sheet**

***All Answer keys**

***Additional Quiz or HW with nine questions**

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Ideas for Task Cards

First, print the cards on card stock. These also print out well in black and white and can be decorated with a highlighter before laminating. Kids love the colors. Print a copy of the student answer sheet for each student.

There are multiple ways to use these task cards in your classroom. Students can work alone, randomly pair up, or work in small groups. When students work in pairs or small groups, give as many task cards as there are students. This way they can help each other, work together, and each student has a task. After a few minutes, depending upon the difficulty level and your experience, each group passes their cards to the next group.

You may also set up math centers or stations with these cards. A fun thing is to put them in a bag and have a grab bag as a warm up or exit pass. If you are new to task cards please download a free product which describes and explains Task Cards. It is full of great ideas written by a great teacher. Here is a shortened link to it. http://bit.ly/Ynswzt

Email me if there are any questions.

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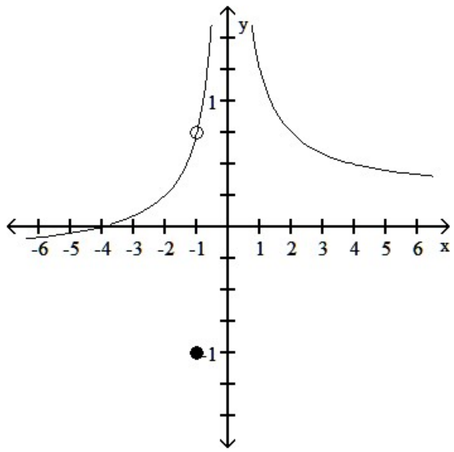
From the graph, determine whether the limit exists. If it exists, find its value.

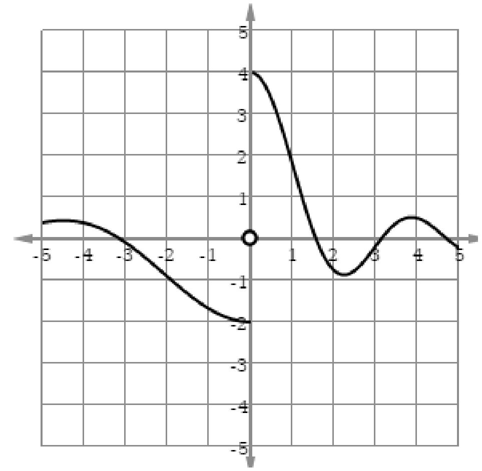
$$\lim_{x \to -1} f(x)$$



1.

From the graph, determine whether the limit exists. If it exists, find its value.

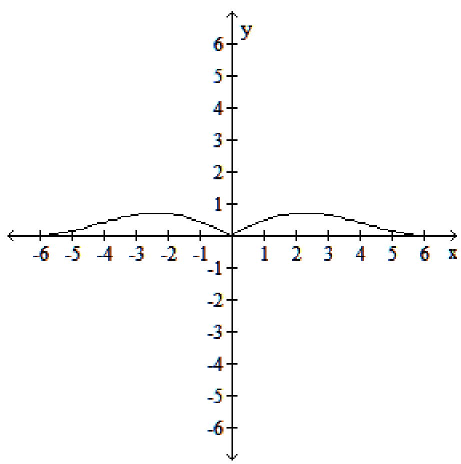
$$\lim_{x \to 0} f(x)$$



2.

From the graph, determine whether the limit exists. If it exists, find its value.

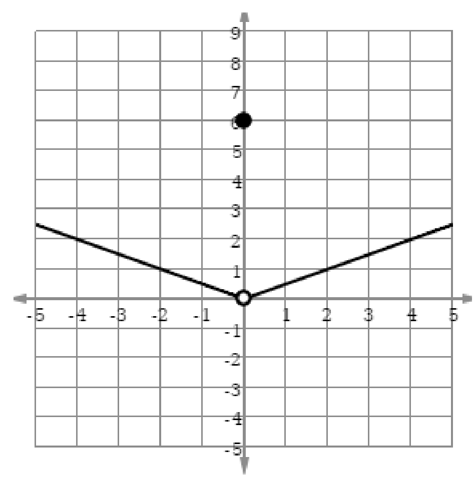
$$\lim_{x \to 0} f(x)$$



3.

From the graph, determine whether the limit exists. If it exists, find its value.

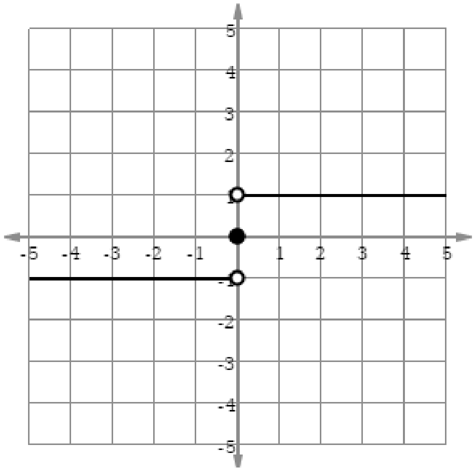
$$\lim_{x \to 0} f(x)$$



4.

From the graph, determine whether the limit exists. If it exists, find its value.

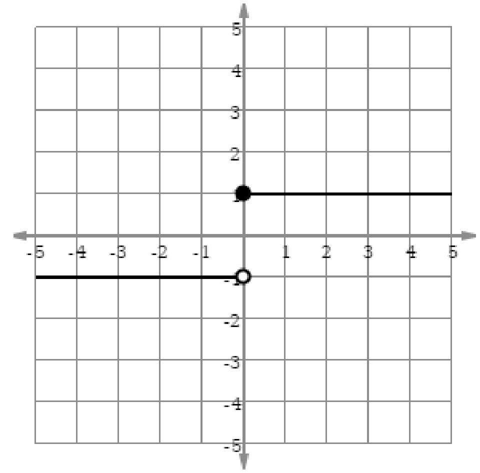
$$\lim_{x \to 0} f(x)$$



5.

From the graph, determine whether the limit exists. If it exists, find its value.

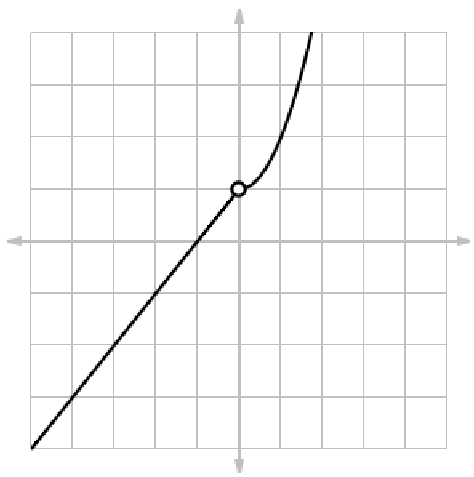
$$\lim_{x \to 0} f(x)$$



6.

From the graph, determine whether the limit exists. If it exists, find its value.

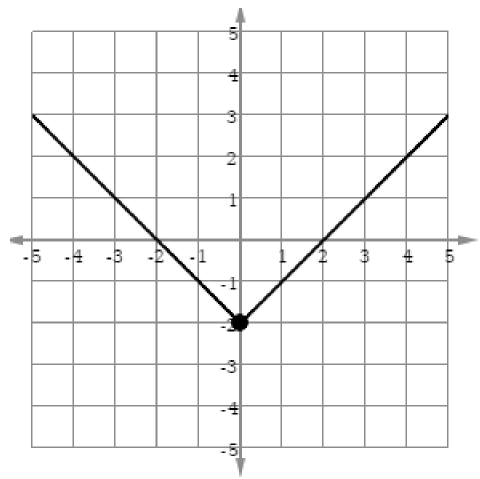
$$\lim_{x \to 0} f(x)$$



7.

From the graph, determine whether the limit exists. If it exists, find its value.

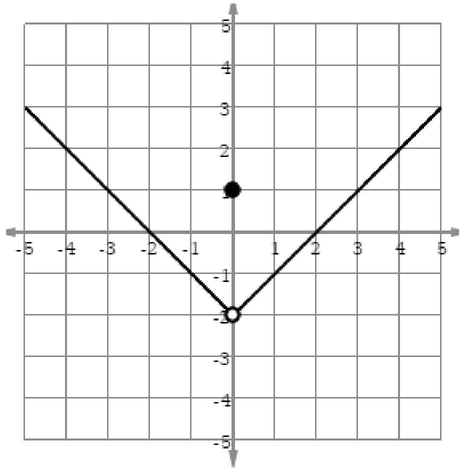
$$\lim_{x \to 0} f(x)$$



8.

From the graph, determine whether the limit exists. If it exists, find its value.

$$\lim_{x \to 0} f(x)$$

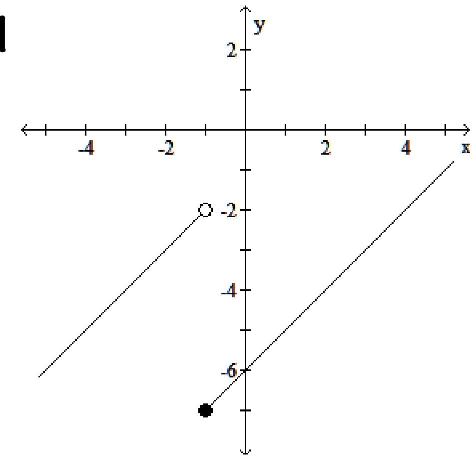


9.

From the graph, determine whether the limit exists. If it exists, find its value.

$$\lim_{x \to -1^-} f(x) \text{ and}$$

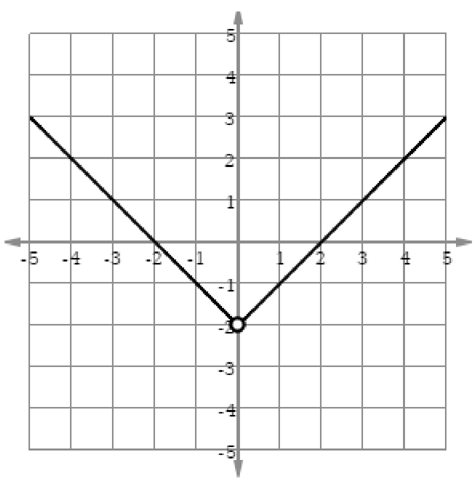
$$\lim_{x \to -1^+} f(x)$$



10.

From the graph, determine whether the limit exists. If it exists, find its value.

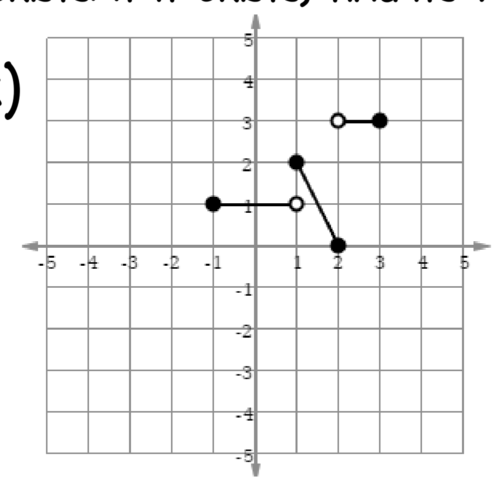
$$\lim_{x \to 0} f(x)$$



11.

From the graph, determine whether the limit exists. If it exists, find its value.

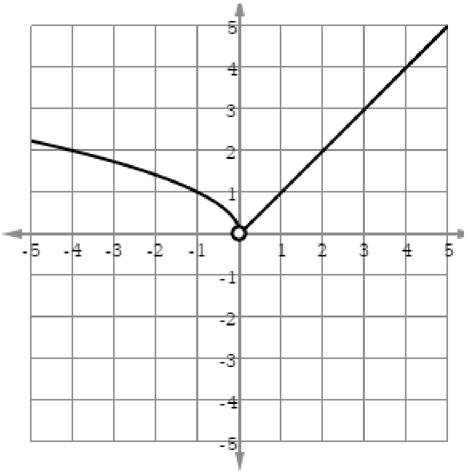
$$\lim_{x \to 1} f(x)$$



12.

From the graph, determine whether the limit exists. If it exists, find its value.

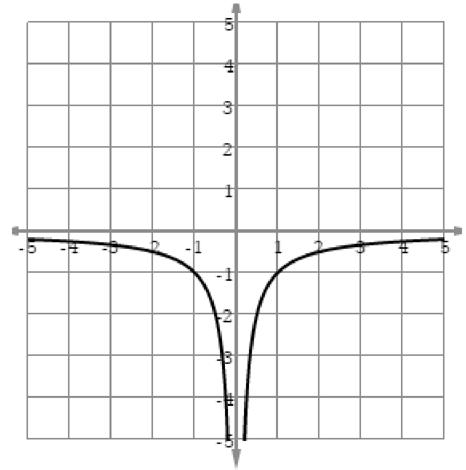
$$\lim_{x \to 0} f(x)$$



13.

From the graph, determine whether the limit exists. If it exists, find its value.

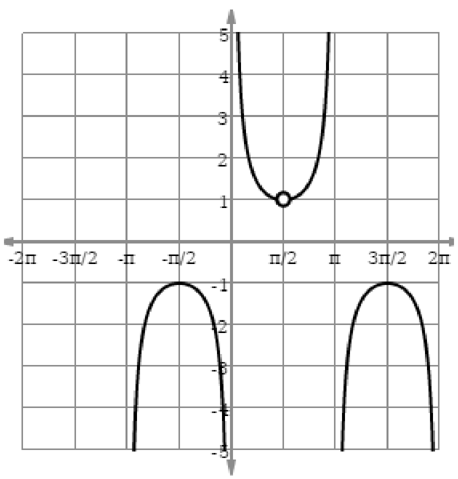
$$\lim_{x \to 0} f(x)$$



14.

From the graph, determine whether the limit exists. If it exists, find its value.

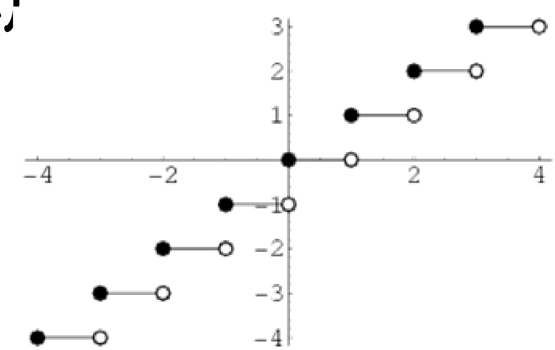
$$\lim_{x \to \frac{\pi}{2}} f(x)$$



15.

From the graph, determine whether the limit exists. If it exists, find its value.

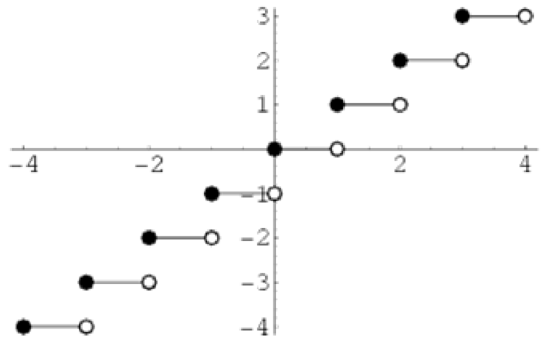
$$\lim_{x \to -1} f(x)$$



16.

From the graph, determine whether the limit exists. If it exists, find its value.

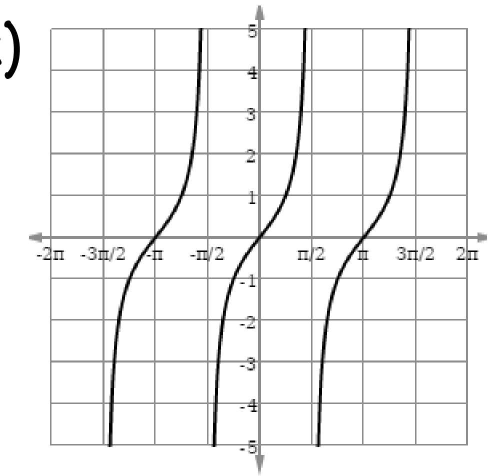
$$\lim_{x\to -1/2} f(x)$$



17.

From the graph, determine whether the limit exists. If it exists, find its value.

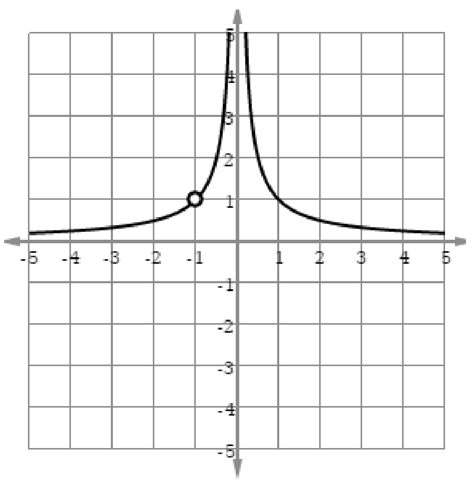
$$\lim_{x\to \pi/2} f(x)$$



18.

From the graph, determine whether the limit exists. If it exists, find its value.

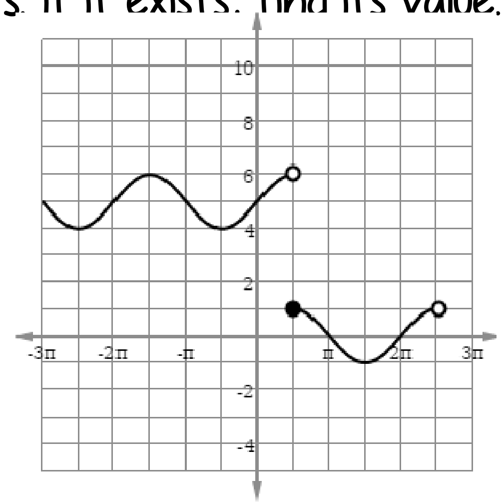
$$\lim_{x\to -1} f(x)$$



19.

From the graph, determine whether the limit exists. If it exists, find its value.

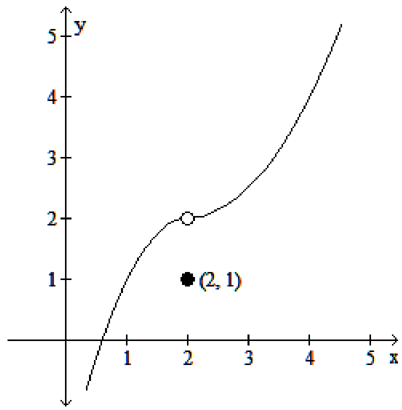
$$\lim_{x\to \pi/2^-} f(x)$$



20.

From the graph, determine whether the limit exists. If it exists, find its value.

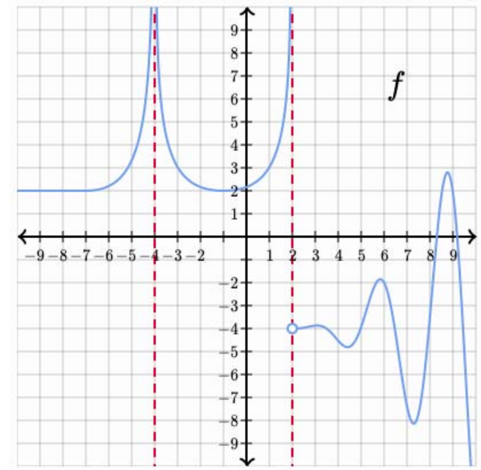
$$\lim_{x\to 2} f(x)$$



21.

From the graph, determine whether the limit exists. If it exists, find its value.

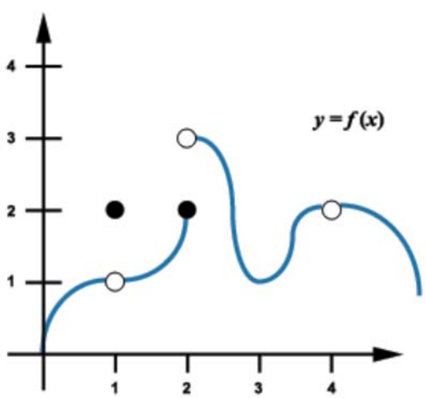
$$\lim_{x\to 2^+} f(x)$$



22.

From the graph, determine whether the limit exists. If it exists, find its value.

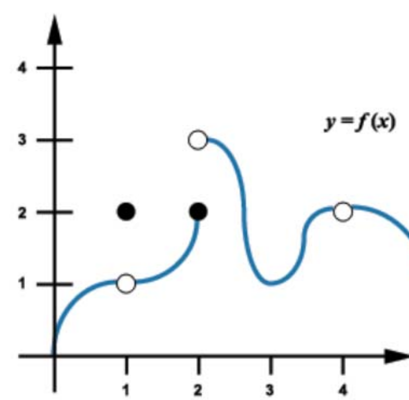
$$\lim_{x\to 1^+} f(x)$$



23.

From the graph, determine whether the limit exists. If it exists, find its value.

$$\lim_{x\to 4} f(x)$$



24.

Task Card Answers

1) $\frac{3}{4}$
2) does not exist
3) 0
4) 0
5) does not exist
6) does not exist
7) 1
8) -2
9) -2
10) -2; -7
11) -2
12) Does not exist
13) 0
14) Does not exist
15) 1
16) Does not exist
17) -1
18) Does not exist
19) 1
20) 6
21) 2
22) -4
23) 1
24) 2

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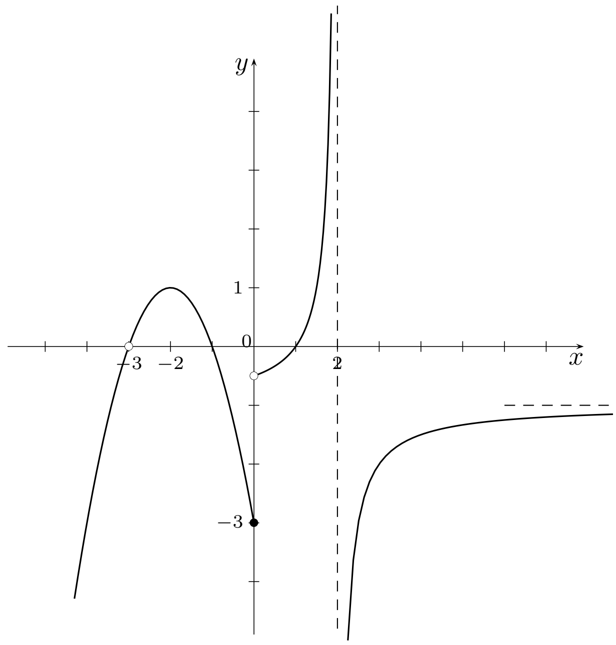
Limits by Graph Notes Name________________________

Example 1: Given the graph of a function $f(x)$, find:



(a) $\lim_{x\to 0} f(x)$

Examine $f(x)$ to the left of $x = 0$,

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

Examine $f(x)$ to the right of $x = 0$,

$\lim_{x\to 0^+} f(x) = -\frac{1}{2}$

y values are not the same; therefore $\lim_{x\to 0} f(x) = D.N.E.$

(b) $\lim_{x\to -3} f(x)$

Visually, the y value to the left of $x = -3$ is same as the y value to the right of $x = -3$; so we say:

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

Note: at $x = -3$, point does not exist but the limit exits.

(c) $\lim_{x\to +\infty} f(x)$

The curve of $f(x)$ as x approaches infinity shows that y value approaches -1 ; so we say:

$\lim_{x\to +\infty} f(x) = -1$

Note: at x is approaching infinity, y approaches -1 (horizontal asymptote).

(d) $\lim_{x\to 2} f(x)$

Examine $f(x)$ to the left of $x = 2$,

$\lim_{x\to 2^-} f(x) = +\infty$

Examine $f(x)$to the right of $x = 2$,

$\lim_{x\to 2^+} f(x) = -\infty$

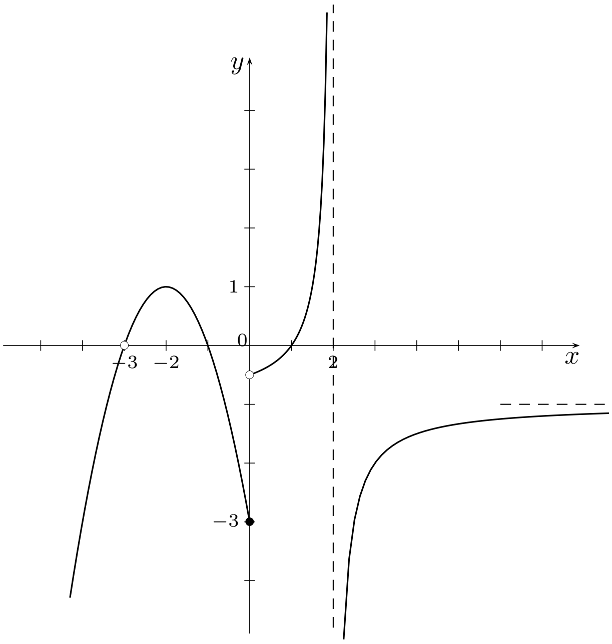
The y values are not the same; therefore $\lim_{x\to 2} f(x) = D.N.E.$

Note: $f(x)$ is undefined at $x = 2$

$x = 2$ is a vertical asymptote)

Limits by Graph Notes Name___________________________

Example 1: Given the graph of a function $f(x)$, find:



(a) $\lim_{x \to 0} f(x)$

(b) $\lim_{x \to -3} f(x)$

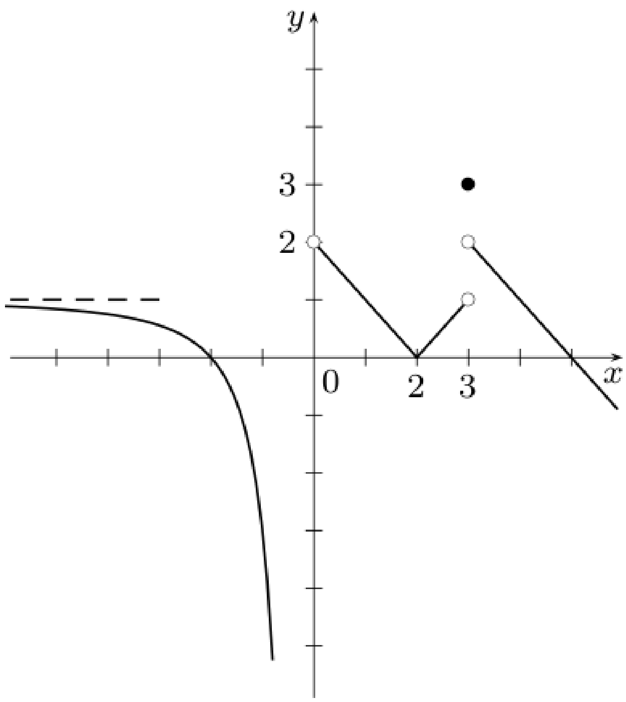
(d) $\lim_{x \to 2} f(x)$

(c) $\lim_{x \to +\infty} f(x)$

LIMITS FROM A GRAPH

Name________________________________
Class______________Date ______________

Use the graphs of the functions below to answer each question. You may use ∞ or - ∞ along with DNE, to answer questions.



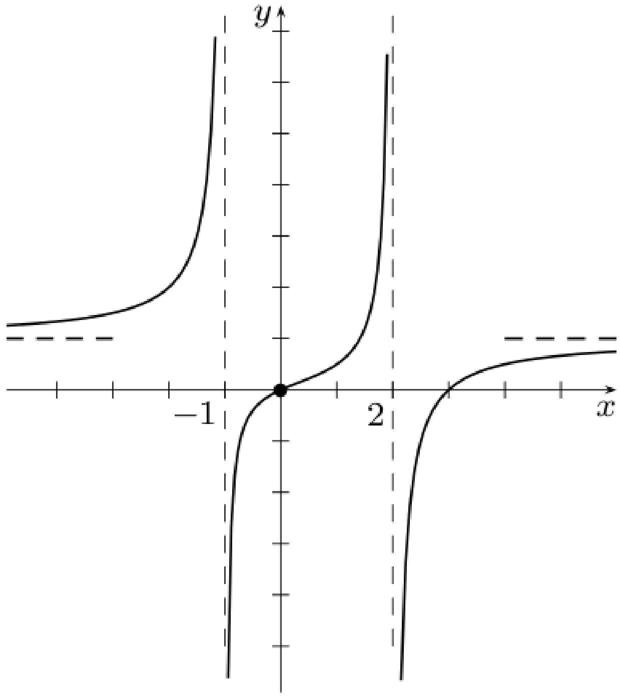
(1) $\lim_{x \to 0^-} f(x) =$ ________

(2) $\lim_{x \to 0} f(x) =$ ________

(3) $\lim_{x \to 3^+} f(x) =$ ________

(4) $\lim_{x \to 3} f(x) =$ ________

(5) $\lim_{x \to -\infty} f(x) =$ ________



(6) $\lim_{x \to -1} f(x) =$ ________

(7) $\lim_{x \to 0} f(x) =$ ________

(8) $\lim_{x \to 2^+} f(x) =$ ________

(9) $\lim_{x \to \infty} f(x) =$ ________

Answers

(1) DNE ,- ∞
(2) DNE
(3) 2
(4) DNE
(5) 1
(6) DNE
(7) 0
(8) DNE ,- ∞
(9) 1

LIMITS BY GRAPH

Name______________________________
Class ________________ Date__________

1.	9.	17.
2.	10.	18.
3.	11.	19.
4.	12.	20.
5.	13.	21.
6.	14.	22.
7.	15.	23.
8.	16.	24.