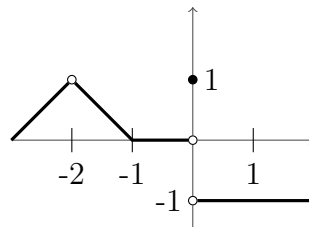


MA111 - Homework Sec. 2.2

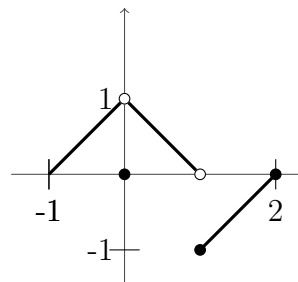
You may work together but do not copy other peoples' work and present it as your own.

1 For the function graphed here find the limits or explain why they do not exist.



- $\lim_{t \rightarrow -2} f(t)$
- $\lim_{t \rightarrow -1} f(t)$
- $\lim_{t \rightarrow 0} f(t)$
- $\lim_{t \rightarrow -0.5} f(t)$

2 Which of the following statements about the function $y = f(x)$ graphed here are true, and which are false?



- $\lim_{x \rightarrow 0} f(x)$ exists.
- $\lim_{x \rightarrow 0} f(x) = 0$
- $\lim_{x \rightarrow 0} f(x) = 1$
- $\lim_{x \rightarrow 1} f(x) = 1$
- $\lim_{x \rightarrow 1} f(x) = 0$
- $\lim_{x \rightarrow c} f(x)$ exists at every point c in $(-1, 1)$.
- $\lim_{x \rightarrow 1} f(x)$ does not exist.

3 Explain why the limit $\lim_{x \rightarrow 0} \frac{|x|}{x}$ does not exist.

4 Explain why the limit $\lim_{x \rightarrow 2} \frac{1}{x-2}$ does not exist.

In **5-12** Find the limits

5 $\lim_{x \rightarrow -4} x^2 - 21$

6 $\lim_{x \rightarrow 3} \sqrt{x^2 - 3}$

7 $\lim_{h \rightarrow 0} \frac{5}{\sqrt{5h+1} + 1}$

8 $\lim_{x \rightarrow -5} \frac{x^2 + 2x - 15}{x + 5}$

9 $\lim_{x \rightarrow -3} \frac{-3x - 9}{x^3 + 3x^2}$

10 $\lim_{x \rightarrow -1} \frac{x + 1}{\sqrt{x + 5} - 2}$

11 $\lim_{x \rightarrow 2} \frac{\sqrt{x^2 + 5} - 3}{x - 2}$

12 $\lim_{x \rightarrow 0} \frac{1 + x + 4 \sin(x)}{7 \cos(x)}$

13 Suppose $\lim_{x \rightarrow 5} f(x) = 0$ and $\lim_{x \rightarrow 5} g(x) = -3$. Find

- $\lim_{x \rightarrow 5} (g(x) + 3)$
- $\lim_{x \rightarrow 5} xf(x)$
- $\lim_{x \rightarrow 5} (g(x))^2$
- $\lim_{x \rightarrow 5} \frac{g(x)}{f(x) - 1}$

14 If $f(x) = \sqrt{x}$ and $x = 8$ find $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$

15 If $3 - 2x^2 \leq g(x) \leq 3 \cos(x)$ for all x then find $\lim_{x \rightarrow 0} g(x)$.

16 Let $f(\theta) = \sin(\theta)/\theta$.

a. Make a table of values of $f(\theta)$ at values of θ that approach $\theta_0 = 0$ from above and below. Then estimate $\lim_{\theta \rightarrow 0} f(\theta)$.

b. Support your conclusion in part (a) by graphing $g(\theta)$ near $\theta_0 = 0$.

17 Let $f(x) = (5^x - 1)/x$

a. Make a table of values of $f(x)$ at value of the graph that approach $c = 0$ from above and below. Does $f(x)$ have a limit as $x \rightarrow 0$? If so, what is it? If not, why not?

b. Support your conclusion in part (a) by graphing $f(x)$ near $c = 0$.

Answers and suggestions, but no solutions. You will need to provide the rest of the work.

1 a. 1 b. 0 c. Does Not Exist d. 0

3 Look at the right-hand and left-hand limits

5 -5

7 $5/2$

9 $-1/3$

11 $2/3$

13 a. 0 b. 0 c. 9 d. 3

15 3

17 a. select some values. b. Plot a graph.