

1.2 Limits and Their Properties

Pages 55-58 #'s 2, 5, 15-25, 58, 67-70

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

x	2.9	2.99	2.999	3	3.001	3.01	3.1
f(x)	.169	.167	.16669	?	.16663	.1663	.1639

$$\lim_{x \rightarrow 3} \frac{x-3}{x^2-9} = .1\bar{6} = \frac{1}{6}$$

$$5) \lim_{x \rightarrow 0} \frac{\sin x}{x}$$

x	-.1	-.01	-.001	0	.001	.01	.1
f(x)	.998	.999	.9999	?	.9999	.9999	.9983

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$15) \lim_{x \rightarrow 3} (4-x) = 1$$

$$16) \lim_{x \rightarrow 0} \sec(x) = 1$$

$$17) \lim_{x \rightarrow 2} f(x) = 2$$

$$18) \lim_{x \rightarrow 1} f(x) = 4$$

$$19) \lim_{x \rightarrow 2} \frac{|x-2|}{x-2} = \text{DNE}$$

the left and right limits do not match at $x=2$

$$20) \lim_{x \rightarrow 5} \frac{2}{x-5} = \text{DNE}$$

the left and right limits do not match at $x=5$

$$21) \lim_{x \rightarrow 0} \cos\left(\frac{1}{x}\right) = \text{DNE}$$

the function oscillates between +1 and -1

$$22) \lim_{x \rightarrow \frac{\pi}{2}} \tan x = \text{DNE}$$

the left and right limits do not match at $x = \frac{\pi}{2}$ and the function is unbounded (going to $\pm\infty$)

23) a) $f(1) = 2$

b) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$ (left and right limits do not match)

c) $f(4) = \text{DNE}$ there is a hole in the graph

d) $\lim_{x \rightarrow 4} f(x) = 2$

24) a) $f(-2) = \text{DNE}$ asymptote

b) $\lim_{x \rightarrow -2} f(x) = \text{DNE}$ unbounded

c) $f(0) = 4$

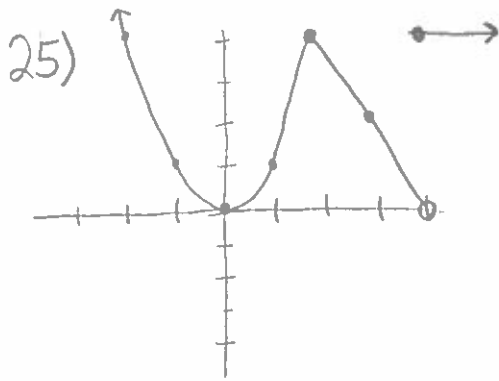
d) $\lim_{x \rightarrow 0} f(x) = \text{DNE}$ (left and right limits do not match)

e) $f(2) = \text{DNE}$ hole

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

g) $f(4) = 2$

h) $\lim_{x \rightarrow 4} f(x) = \text{DNE}$ unbounded



The limit exists for all values except $x = 4$

58) A function can be undefined at c but still have a limit

67) False

68) True

69) False

70) False