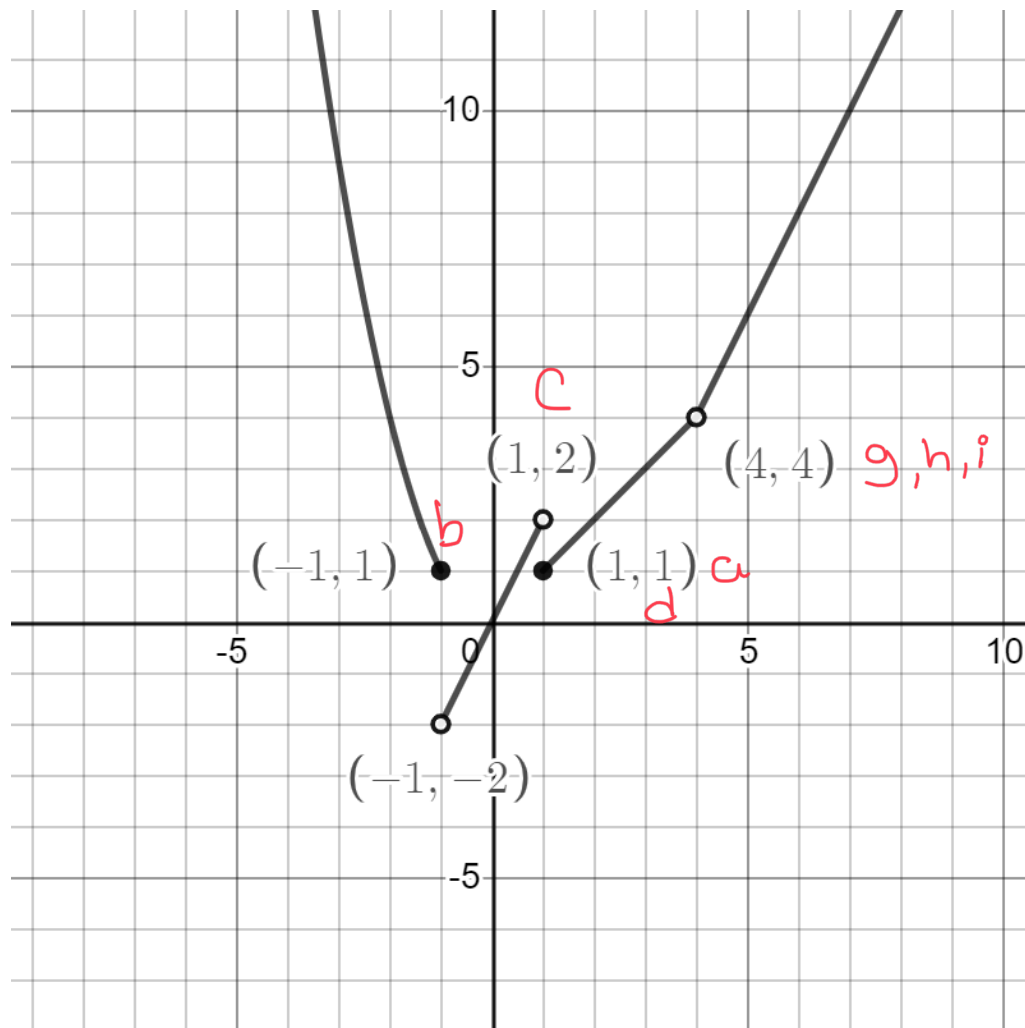


Section 1.1 Limits (minimum homework: 1.1 1-11 odds, 15, 19 and 21)

(minimum homework: 1.1 1-11 odds, 15, 19 and 21)

1) Below is a graph of the function $f(x)$.



Find the following

a) $f(1) = 1$

b) $f(-1) = 1$

c) $f(4) = \text{undefined}$

d) $\lim_{x \rightarrow 1^-} f(x) = 2$

e) $\lim_{x \rightarrow 1^+} f(x) = 1$

f) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$

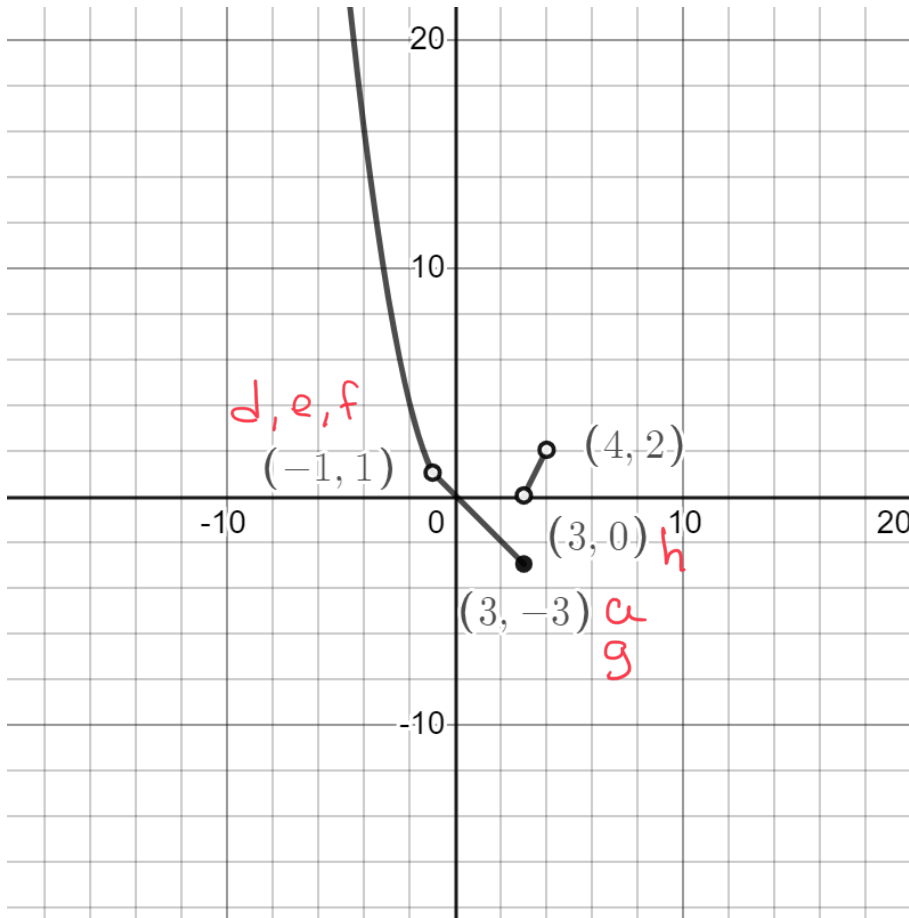
g) $\lim_{x \rightarrow 4^-} f(x) = 4$

h) $\lim_{x \rightarrow 4^+} f(x) = 4$

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

(minimum homework: 1.1 1-11 odds, 15, 19 and 21)

3) Below is a graph of the function $f(x)$.



Find the following

a) $f(3) = -3$

b) $f(4) = \text{undefined}$

c) $f(-1) = \text{undefined}$

d) $\lim_{x \rightarrow -1^-} f(x) = 1$

e) $\lim_{x \rightarrow -1^+} f(x) = 1$

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

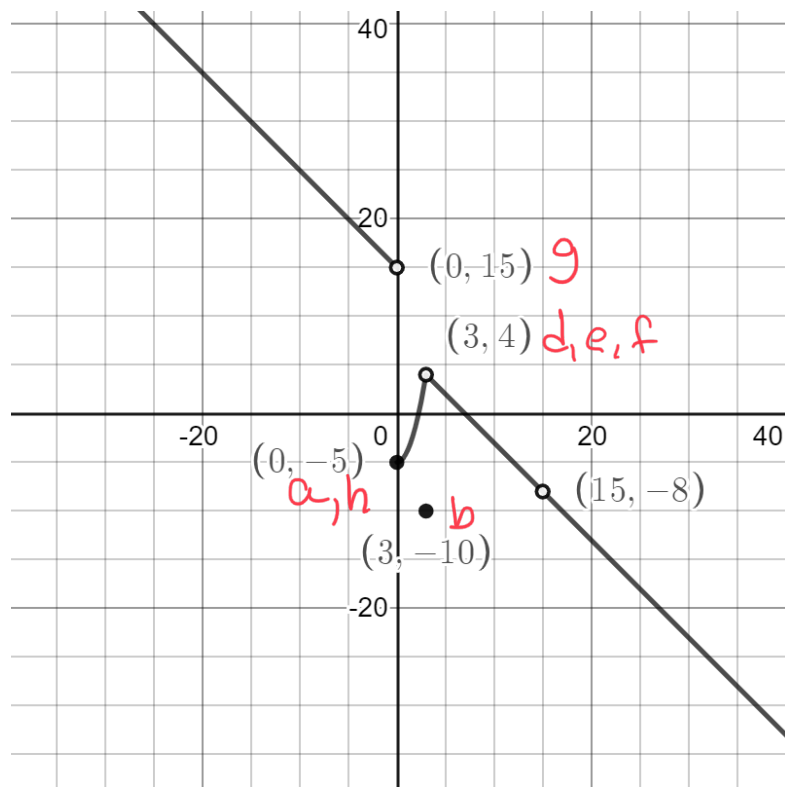
g) $\lim_{x \rightarrow 3^-} f(x) = -3$

h) $\lim_{x \rightarrow 3^+} f(x) = 0$

i) $\lim_{x \rightarrow 3} f(x) = DNE$

(minimum homework: 1.1 1-11 odds, 15, 19 and 21)

5) Below is a graph of the function $f(x)$.



Find the following:

a) $f(0) = -5$

b) $f(3) = -10$

c) $f(15) = \text{undefined}$

d) $\lim_{x \rightarrow 3^-} f(x) = 4$

e) $\lim_{x \rightarrow 3^+} f(x) = 4$

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

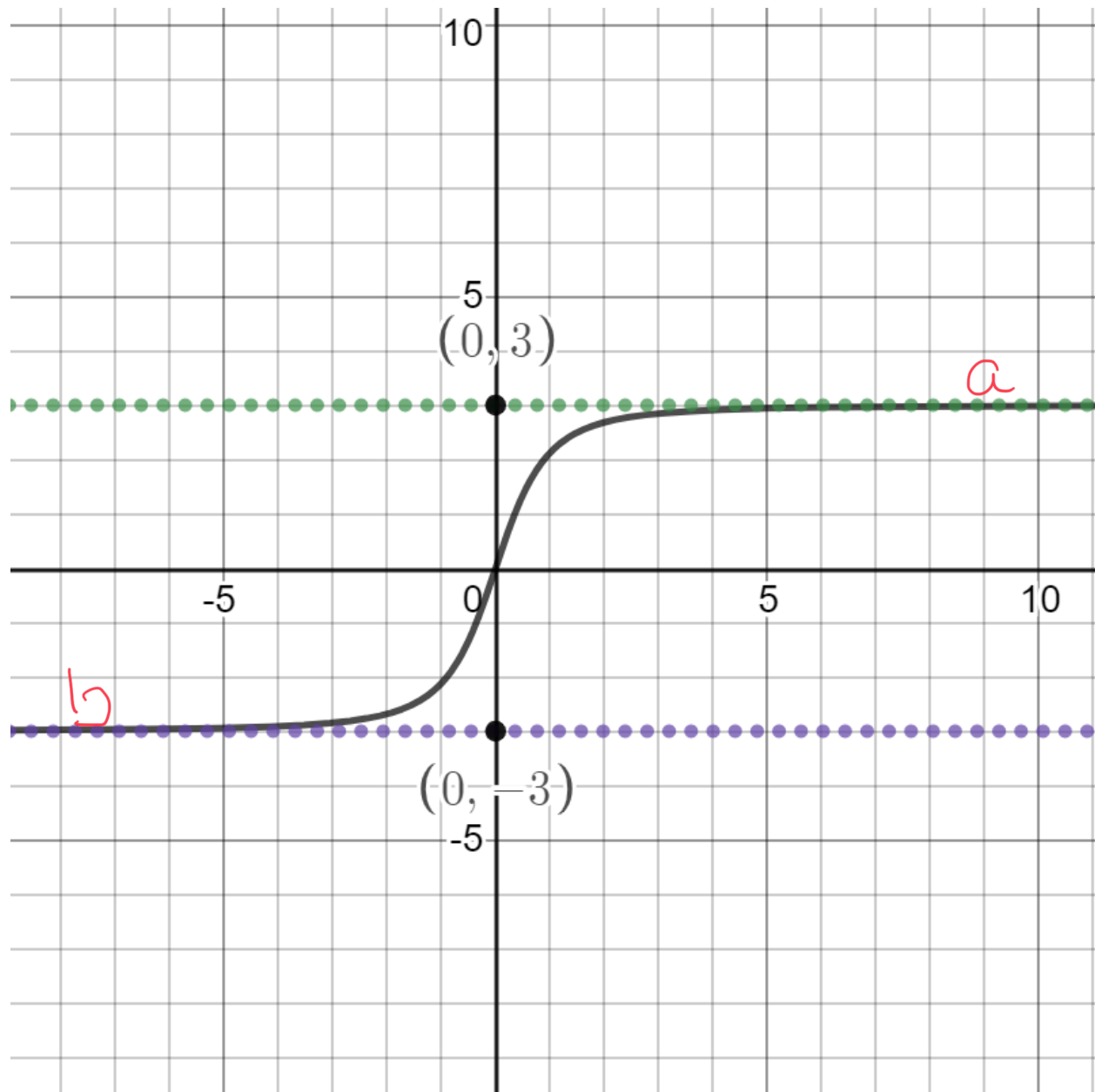
g) $\lim_{x \rightarrow 0^-} f(x) = 15$

h) $\lim_{x \rightarrow 0^+} f(x) = -5$

i) $\lim_{x \rightarrow 0} f(x) = DNE$

(minimum homework: 1.1 1-11 odds, 15, 19 and 21)

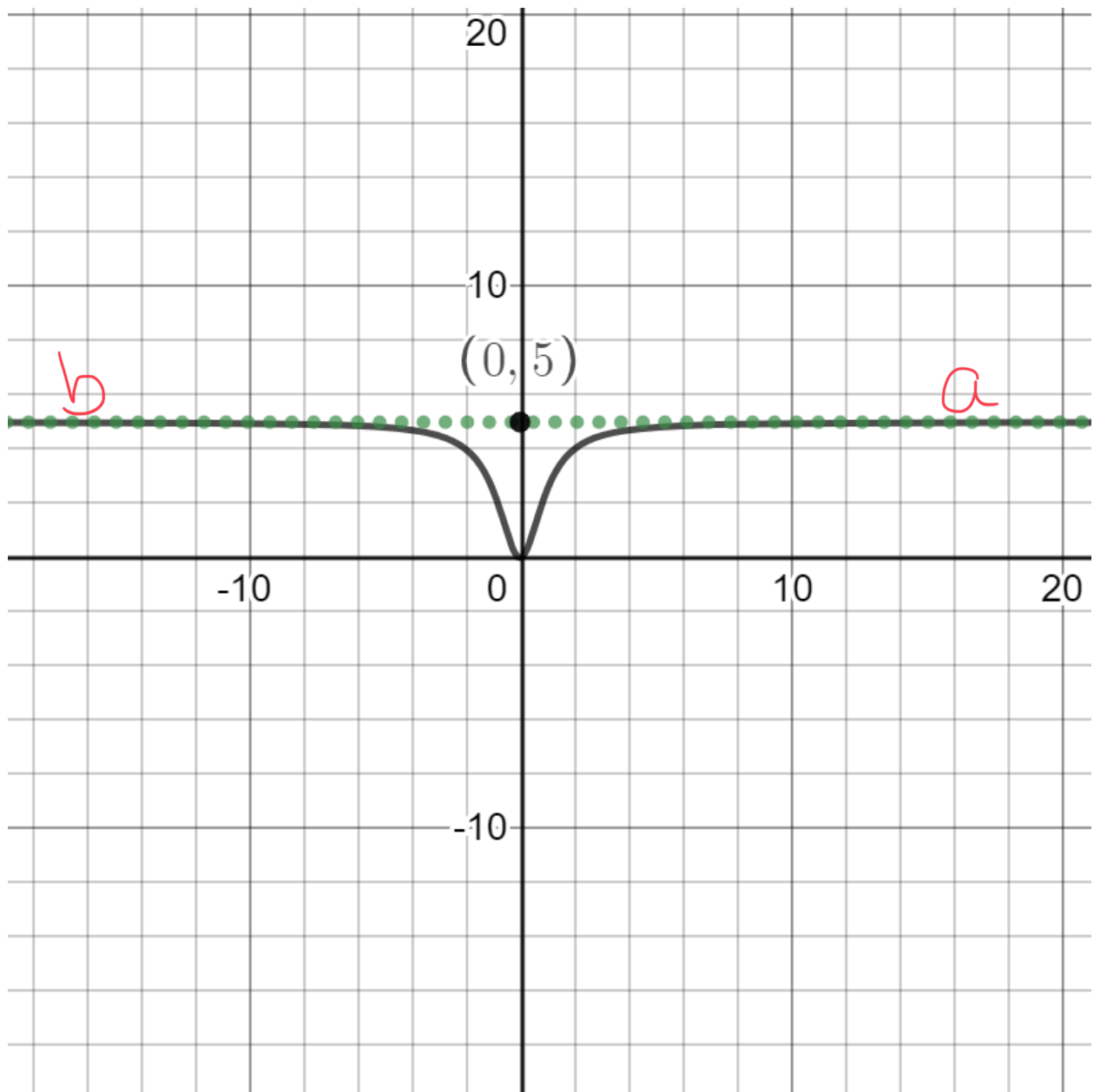
7) Below is a graph of the function $f(x)$. Find the value of each limit (if it exists)



7a) $\lim_{x \rightarrow \infty} f(x) = 3$

7b) $\lim_{x \rightarrow -\infty} f(x) = -3$

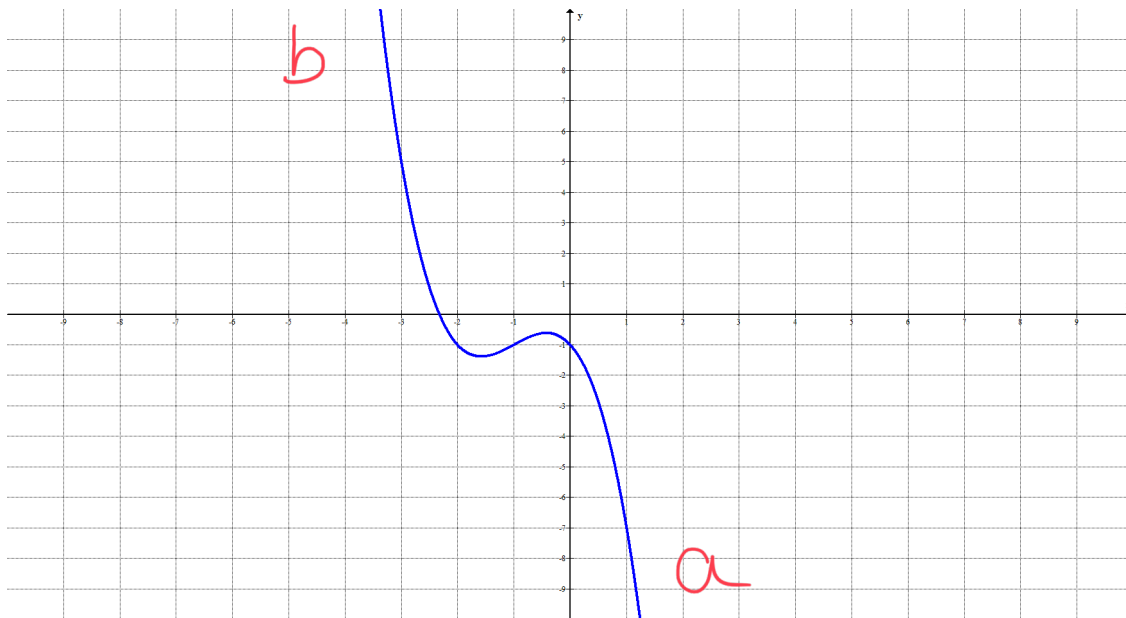
9) Below is a graph of the function $f(x)$. Find the value of each limit (if it exists)



9a) $\lim_{x \rightarrow \infty} f(x) = 5$

9b) $\lim_{x \rightarrow -\infty} f(x) = 5$

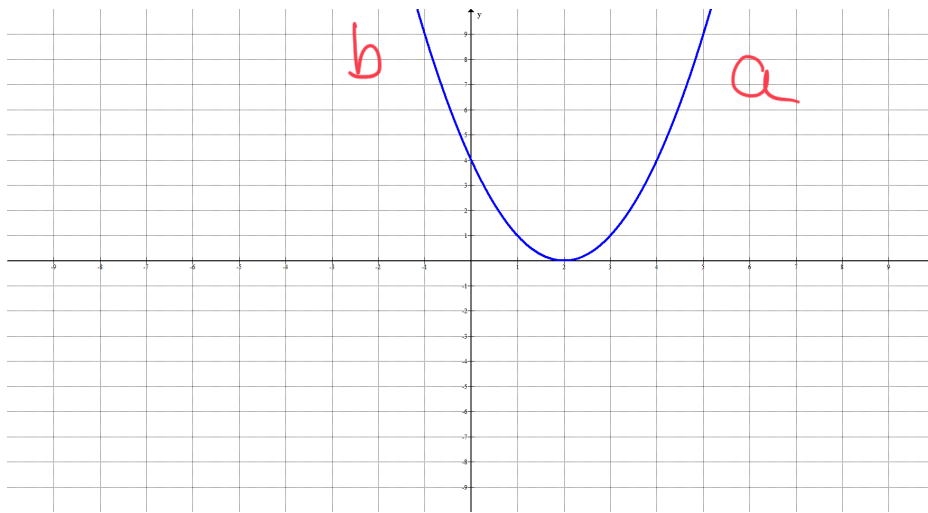
11) Below is a graph of the function $f(x)$. Find the value of each limit (if it exists)



11a) $\lim_{x \rightarrow \infty} f(x) = -\infty$

11b) $\lim_{x \rightarrow -\infty} f(x) = \infty$

13) Below is a graph of the function $f(x)$. Find the value of each limit (if it exists)



13a) $\lim_{x \rightarrow \infty} f(x) = \infty$

13b) $\lim_{x \rightarrow -\infty} f(x) = \infty$

#15-26: Complete the table(s) and find the requested limits. (try to carry as decimals as you can in your answer)

15a) $\lim_{x \rightarrow 2^-} (3x + 5) = 11$

x	1.5	1.9	1.99	1.999
f(x)	9.5	10.7	10.97	10.997

15b) $\lim_{x \rightarrow 2^+} (3x + 5) = 11$

x	2.5	2.1	2.01	2.001
f(x)	12.5	11.3	11.03	11.003

15c) Use the results from part a and b to find: $\lim_{x \rightarrow 2} (3x + 5) = 11$

17) $f(x) = \frac{x+2}{x-1}$ find

17) $f(x) = \frac{x+2}{x-1}$ find

17a) $\lim_{x \rightarrow 2^-} \frac{x+2}{x-1} = 4$

x	1.5	1.9	1.99	1.999
f(x)	7	4.33	4.03	4.003

17b) $\lim_{x \rightarrow 2^+} \frac{x+2}{x-1} = 4$

x	2.5	2.1	2.01	2.001
f(x)	3	3.72	3.9702	3.99702

17c) Use the results from part a and b to find: $\lim_{x \rightarrow 2} \frac{x+2}{x-1} = 4$

19) $f(x) = \frac{\sqrt{x}-3}{x-9}$, find

a) $\lim_{x \rightarrow 9^-} \frac{\sqrt{x}-3}{x-9} = 0.1\bar{6}$

x	8.5	8.9	8.99	8.999
f(x)	.169	.167	.1667	.16667

b) $\lim_{x \rightarrow 9^+} \frac{\sqrt{x}-3}{x-9} = 0.1\bar{6}$

x	9.5	9.1	9.01	9.001
f(x)	.164	.1662	.1666	.16666

$$21) f(x) = \frac{2x^2+3x+5}{x^2+4x-5}$$

Complete the table to estimate $\lim_{x \rightarrow \infty} \frac{2x^2+3x+5}{x^2+4x-5}$

x	100	1000	100,000	1,000,000
f(x)	1.95	1.995	1.99995	1.999995

$$\lim_{x \rightarrow \infty} \frac{2x^2+3x+5}{x^2+4x-5} = 2$$

$$23) f(x) = \frac{6x^3 - x^2 + 2x + 5}{3x^4 + 4x^2 - 5x}$$

Complete the table to estimate $\lim_{x \rightarrow \infty} \frac{6x^3 - x^2 + 2x + 5}{3x^4 + 4x^2 - 5x}$

x	100	1000	100,000	1,000,000
f(x)	.01996	.001999	.00001999	.00000199

$$\lim_{x \rightarrow \infty} \frac{6x^3 - x^2 + 2x + 5}{3x^4 + 4x^2 - 5x} = 0$$

$$25) f(x) = \frac{6x^5 - x^2 + 2x + 5}{3x^4 + 4x^2 - 5x}$$

Complete the table to estimate $\lim_{x \rightarrow \infty} \frac{6x^5 - x^2 + 2x + 5}{3x^4 + 4x^2 - 5x} = \infty$

x	100	1000	10000	100000
f(x)	199.97	2000	20000	200000