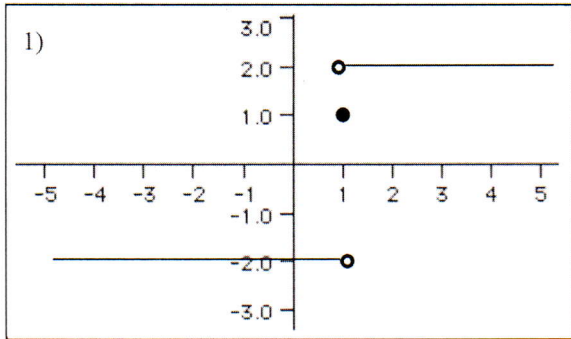
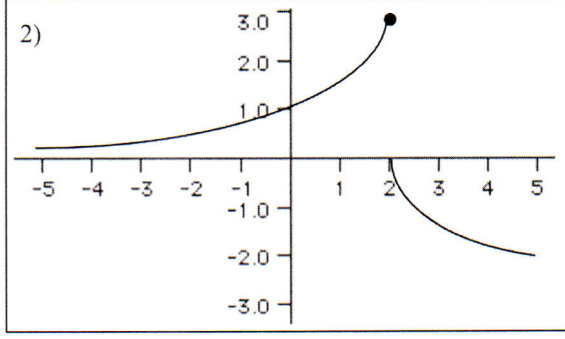


2 Limits: Tabular and Graphical Approach

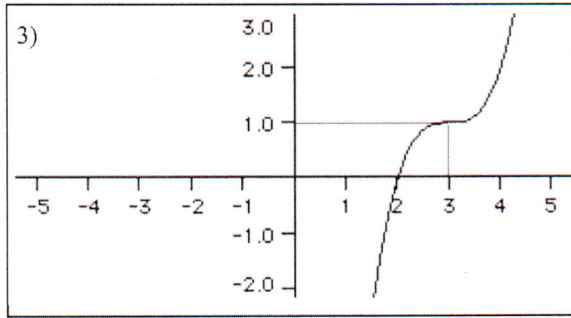
Work on
this paper



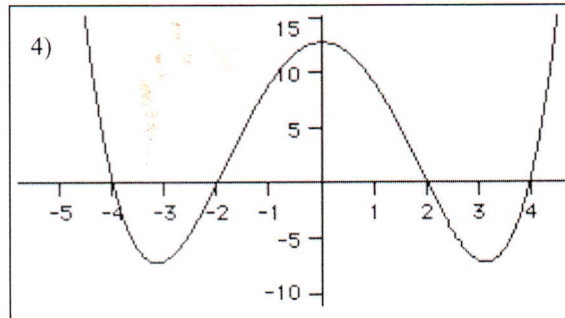
- 1) a) $\lim_{x \rightarrow 1^-} f(x) = -2$ b) $\lim_{x \rightarrow 1^+} f(x) = 2$ c) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$
d) $f(1) = -2$ e) $\lim_{x \rightarrow -\infty} f(x) = -2$ f) $\lim_{x \rightarrow \infty} f(x) = 2$



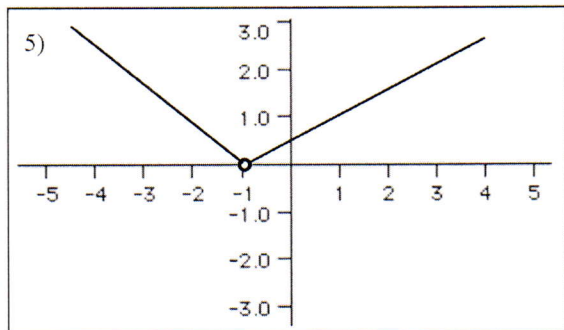
- 2) a) $\lim_{x \rightarrow 2^-} f(x) = 3$ b) $\lim_{x \rightarrow 2^+} f(x) = 0$ c) $\lim_{x \rightarrow 2} f(x) = \text{DNE}$
d) $f(2) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = 0$ f) $\lim_{x \rightarrow \infty} f(x) = -2$ or $(-\infty)$



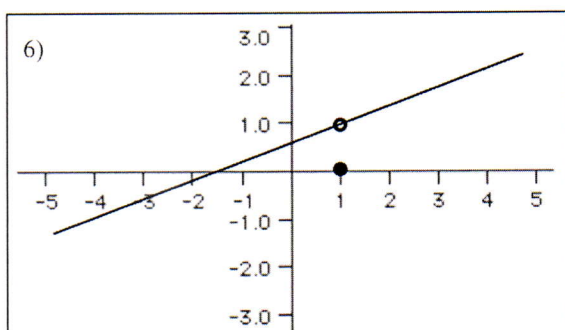
- 3) a) $\lim_{x \rightarrow 3^-} f(x) = 1$ b) $\lim_{x \rightarrow 3^+} f(x) = 1$ c) $\lim_{x \rightarrow 3} f(x) = 1$
d) $f(3) = 1$ e) $\lim_{x \rightarrow -\infty} f(x) = -\infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$



- 4) a) $\lim_{x \rightarrow 0^-} f(x) = 13$ b) $\lim_{x \rightarrow 0^+} f(x) = 13$ c) $\lim_{x \rightarrow 0} f(x) = 13$
d) $f(0) = 13$ e) $\lim_{x \rightarrow -\infty} f(x) = \infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$

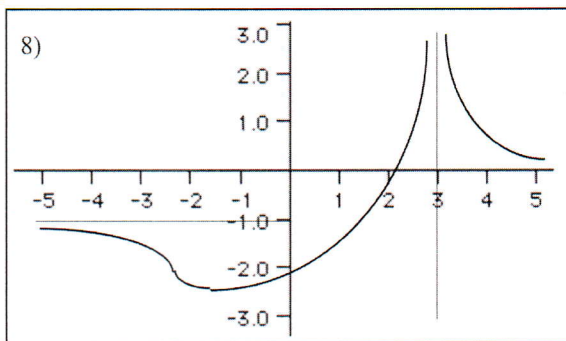
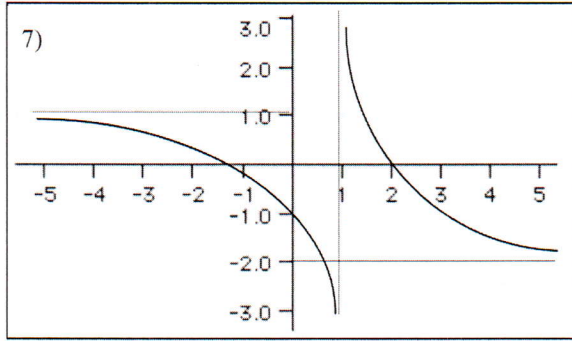


- 5) a) $\lim_{x \rightarrow -1^-} f(x) = 0$ b) $\lim_{x \rightarrow -1^+} f(x) = 0$ c) $\lim_{x \rightarrow -1} f(x) = 0$
d) $f(-1) = \text{DNE}$ e) $\lim_{x \rightarrow -\infty} f(x) = \infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$
or undefined



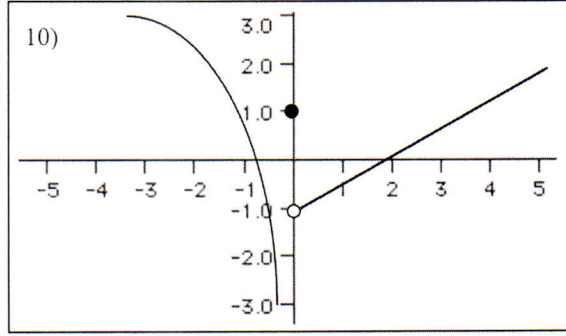
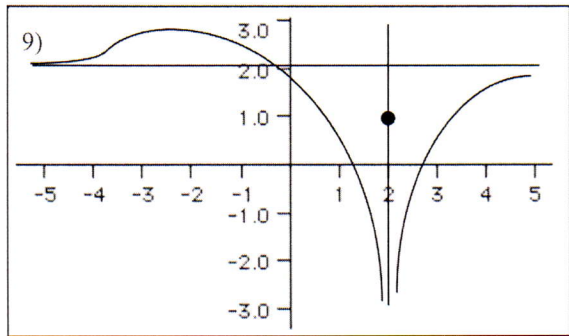
- 6) a) $\lim_{x \rightarrow 1^-} f(x) = 1$ b) $\lim_{x \rightarrow 1^+} f(x) = 0$ c) $\lim_{x \rightarrow 1} f(x) = 1$
d) $f(-1) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = -\infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$

+1
↙



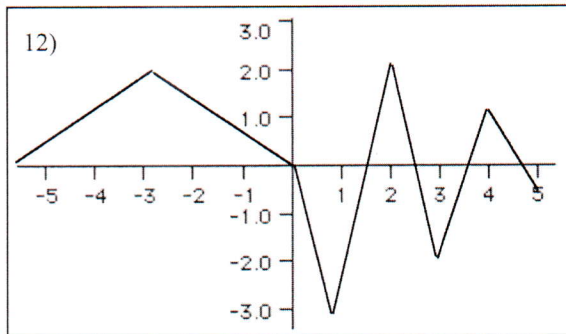
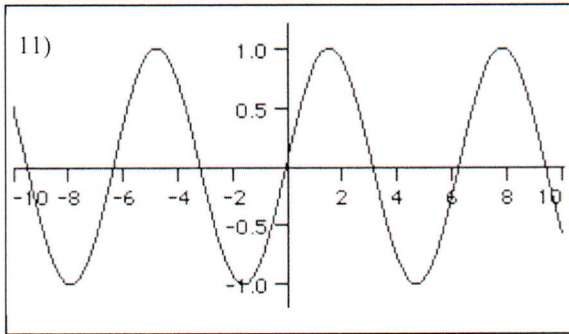
- a) $\lim_{x \rightarrow 1^-} f(x) = \infty$ b) $\lim_{x \rightarrow 1^+} f(x) = \infty$ c) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$ d) $f(1) = \text{undef.}$ e) $\lim_{x \rightarrow -\infty} f(x) = -1$ f) $\lim_{x \rightarrow \infty} f(x) = -2$

- a) $\lim_{x \rightarrow 3^-} f(x) = -\infty$ b) $\lim_{x \rightarrow 3^+} f(x) = \infty$ c) $\lim_{x \rightarrow 3} f(x) = \infty$ d) $f(3) = \text{undef.}$ e) $\lim_{x \rightarrow -\infty} f(x) = -1$ f) $\lim_{x \rightarrow \infty} f(x) = 0$



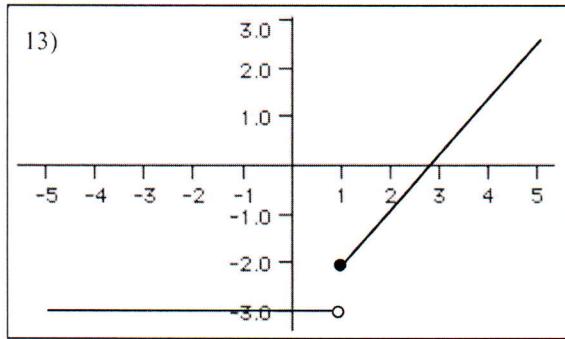
- a) $\lim_{x \rightarrow 2^-} f(x) = -\infty$ b) $\lim_{x \rightarrow 2^+} f(x) = -\infty$ c) $\lim_{x \rightarrow 2} f(x) = -\infty$ d) $f(2) = 1$ e) $\lim_{x \rightarrow -\infty} f(x) = 2$ f) $\lim_{x \rightarrow \infty} f(x) = 2$

- a) $\lim_{x \rightarrow 0^-} f(x) = -\infty$ b) $\lim_{x \rightarrow 0^+} f(x) = -1$ c) $\lim_{x \rightarrow 0} f(x) = \text{DNE}$ d) $f(0) = 1$ e) $\lim_{x \rightarrow -\infty} f(x) = 3$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$ or ∞

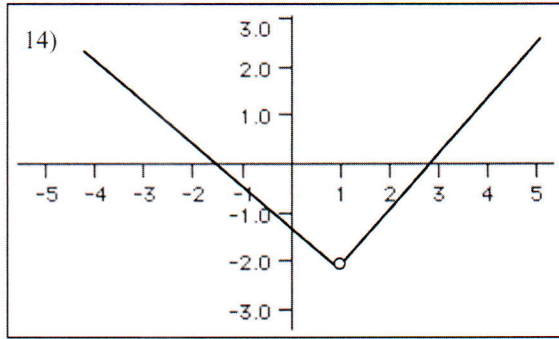


- a) $\lim_{x \rightarrow 0^-} f(x) = 0$ b) $\lim_{x \rightarrow 0^+} f(x) = 0$ c) $\lim_{x \rightarrow 0} f(x) = 0$ d) $f(0) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = \text{DNE}$ f) $\lim_{x \rightarrow \infty} f(x) = \text{DNE}$

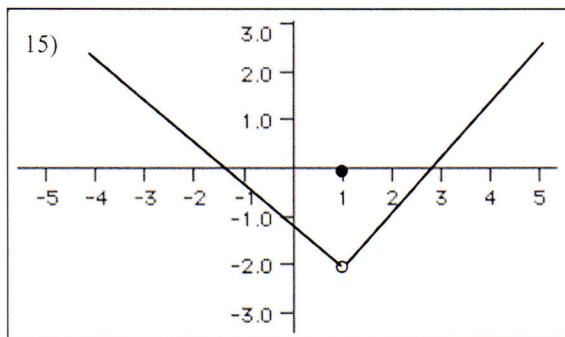
- a) $\lim_{x \rightarrow 0^-} f(x) = 0$ b) $\lim_{x \rightarrow 0^+} f(x) = 0$ c) $\lim_{x \rightarrow 0} f(x) = 0$ d) $f(0) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = -\infty$ f) $\lim_{x \rightarrow \infty} f(x) = -\infty$ or $-\infty$



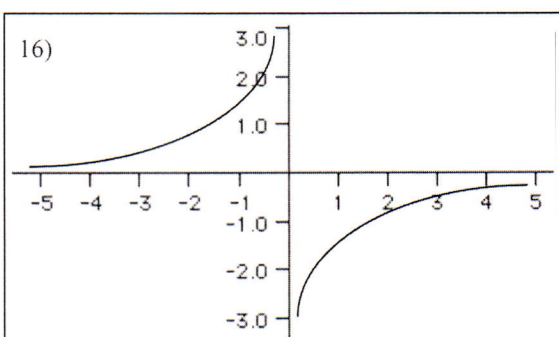
- a) $\lim_{x \rightarrow 1^-} f(x) = -3$ b) $\lim_{x \rightarrow 1^+} f(x) = -2$ c) $\lim_{x \rightarrow 1} f(x) = \text{DNE}$
 d) $f(1) = -2$ e) $\lim_{x \rightarrow -\infty} f(x) = -3$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$



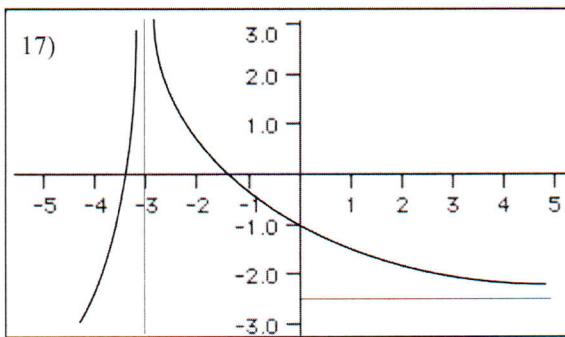
- a) $\lim_{x \rightarrow 1^-} f(x) = -2$ b) $\lim_{x \rightarrow 1^+} f(x) = -2$ c) $\lim_{x \rightarrow 1} f(x) = -2$
 d) $f(1) = \text{undef.}$ e) $\lim_{x \rightarrow -\infty} f(x) = \infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$



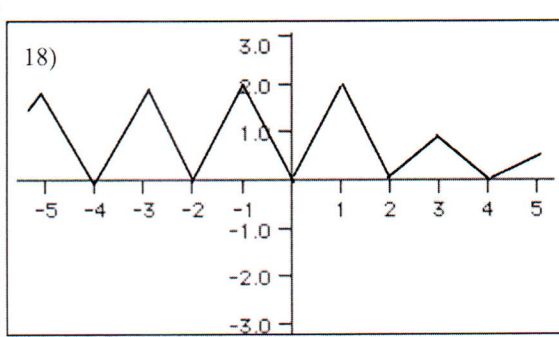
- a) $\lim_{x \rightarrow 1^-} f(x) = -2$ b) $\lim_{x \rightarrow 1^+} f(x) = -2$ c) $\lim_{x \rightarrow 1} f(x) = -2$
 d) $f(1) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = \infty$ f) $\lim_{x \rightarrow \infty} f(x) = \infty$



- a) $\lim_{x \rightarrow 0^-} f(x) = \infty$ b) $\lim_{x \rightarrow 0^+} f(x) = -\infty$ c) $\lim_{x \rightarrow 0} f(x) = \text{DNE}$
 d) $f(0) = \text{undef.}$ e) $\lim_{x \rightarrow -\infty} f(x) = 0$ f) $\lim_{x \rightarrow \infty} f(x) = 0$



- a) $\lim_{x \rightarrow -3^-} f(x) = \infty$ b) $\lim_{x \rightarrow -3^+} f(x) = -\infty$ c) $\lim_{x \rightarrow -3} f(x) = \infty$ d) $f(-3) = \text{undef.}$
 e) $\lim_{x \rightarrow -\infty} f(x) = -\infty$ f) $\lim_{x \rightarrow \infty} f(x) = 2.5$



- a) $\lim_{x \rightarrow 0^-} f(x)$ b) $\lim_{x \rightarrow 0^+} f(x) = 0$ c) $\lim_{x \rightarrow 0} f(x) = 0$
 d) $f(0) = 0$ e) $\lim_{x \rightarrow -\infty} f(x) = \text{DNE}$ f) $\lim_{x \rightarrow \infty} f(x) = 0$

You may want to use the free calculator at [desmos.com](https://www.desmos.com) and the table function.

Complete each table to find the limit

19. $\lim_{x \rightarrow 2} \frac{x-2}{x^2-x-2} = .\overline{33} = \frac{1}{3}$

x	1.9	1.99	1.999	2	2.001	2.01	2.1
$f(x)$	.3448	.3344	.3334		.3332	.3322	.3220

20. $\lim_{x \rightarrow 0} \frac{\sqrt{x+3}-\sqrt{3}}{x} = .2887$

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
$f(x)$	.2911	.2889	.2887		.2887	.2884	.2863

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

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
$f(x)$	.9983	1	1		1	1	.9983

22. $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x} = 0$

x	-0.1	-0.01	-0.001	0	0.001	0.01	0.1
$f(x)$	.05	.005	.0005		-.0005	-.005	-.05