

Lesson 2.2.2

2-57. See below:

- a. ∞ : DNE
- b. 0
- c. 1
- d. 1
- e. $\lim_{x \rightarrow \infty} f(x)$ equals a constant and that constant is the y -value of the horizontal asymptote.
- f. $\lim_{x \rightarrow -\infty} \arctan x = -\frac{\pi}{2}$ and $\lim_{x \rightarrow \infty} \arctan x = \frac{\pi}{2}$

2-58. See below:

- a. Both $\rightarrow \infty$.
- b. Yes, both $\rightarrow \infty$.
- c. ∞ : DNE

2-59. See below:

- a. $\lim_{x \rightarrow 2^-} f(x) \neq \lim_{x \rightarrow 2^+} f(x)$
- b. $\lim_{x \rightarrow 2^-} f(x) \neq \lim_{x \rightarrow 2^+} f(x)$

2-60. $\lim_{x \rightarrow 0^+} f(x) = 1$; $\lim_{x \rightarrow 0^-} f(x) = -1$. Therefore, $\lim_{x \rightarrow 0} f(x)$ does not exist.

2-61.

a	$\lim_{x \rightarrow a^-} f(x)$	$\lim_{x \rightarrow a^+} f(x)$	$\lim_{x \rightarrow a} f(x)$	$f(a)$
1	[2]	[2]	[2]	[DNE]
2	[4]	[4]	[4]	[4]
3	[2.5]	[1]	[DNE]	[2.5]
4	[$+\infty$]	[$+\infty$]	[∞ : DNE]	[DNE]

2-62. See below:

- a. no.
- b. no.
- c. Not necessarily: $\lim_{x \rightarrow a} f(x)$ might not equal $f(a)$.
- d. See Math Note in Lesson 2.2.3 for a list of conditions.

2-63. See below:

- a. 3
- b. $-\infty$ or DNE
- c. 1
- d. 2
- e. undefined
- f. ∞ or no limit
- g. 4
- h. DNE
- i. undefined

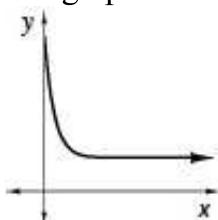


2-64. See below:

- a. yes
- b. 2

2-65. See below:

- a. See graph below.



- b. room temperature

2-66. See below:

- a. $D: \{x : \text{is real}\}; R: \{y : y \geq 1\}$
- b. $D: \{x : x \geq -3\}; R: \{y : y \geq -2\}$

2-67. Answers vary, but must have horizontal asymptotes at $y = 2$ (to the left) and $y = -2$ (to the right).

2-68. A line

2-69. $\sum_{i=0}^7 1 \cdot (-2 + 1 \cdot i) \cos(-2 + 1 \cdot i) \approx 4.166 \text{ units}^2$

2-70. $\approx -3.249 \text{ units}^2$; no

2-71. See below:

- a. $y = 1$
- b. $y = 1$
- c. DNE
- d. $\frac{x-8}{x}$
- e. $\frac{m}{m+4}$
- f. $\frac{x+h-3}{x+h+5}$

2-72. See below:

- a. It is the slope.
- b. On the intervals $(2, 4)$ and $(8, 10)$.
- c. 40 ft/sec^2
- d. The velocity is constant.
- e. $\approx 490 \text{ ft}$