# Chapter 2 Answer Section

## Quick Quiz 2.1 Answers:

**1**a **2**c **3**b **4**a **5**a **6**a

## Quick Quiz 2.2 Answers:

**1**b **2**a **3**c **4**c **5**c **6**b **7**c **8**a **9**c **10**b

## Quick Quiz 2.3 Answers:

**1**c **2**c **3**c **4**b **5**c **6**b **7**b **8**a **9**c **10**b

## Quick Quiz 2.4 Answers:

**1**a **2**a **3**c **4**a **5**c **6**c **7**a **8**a

## Quick Quiz 2.5 Answers:

**1**b **2**a **3**c **4**c **5**b **6**a **7**b **8**c **9**c **10**b

## Quick Quiz 2.6 Answers:

**1**b **2**a **3**c **4**c **5**c **6**c **7**a **8**b **9**c **10**c

## Quick Quiz 2.7 Answers:

**1**b **2**c **3**b **4**c **5**c **6**a **7**c

# Chapter 2 Review Question Answers

**1.** The value of the function tends to $L$ as $x$ tends to $a$.

**2.** Let $f$ be a function defined on an open interval containing $a$; $f$ need not be defined at the point $a$. The limit $\lim_{x\to a} f(x) = L$ means that for all $\varepsilon > 0$ there exists a $\delta > 0$ such that if $|x-a| < \delta$, then $|f(x) - L| < \varepsilon$.

**3.** Any positive value of $\delta$ will satisfy this condition provided that it is less than $\frac{1}{4}$.

**4.** They must exist and be equal.

**5.** The function $\sqrt{x-1}$ is defined only when $x \geq 1$, which occurs only in the right-sided limit.

**6.** This is because the limit asks how the function behaves as $x$ gets near 1, not when $x = 1$.

**7.** No; the left- and right-sided limits of $\frac{x-1}{x^2-4x+3}$ as $x$ approaches 1 do not approach $\pm\infty$ (a requirement for a vertical asymptote), whereas the limits associated with $x = 3$ do approach $\pm\infty$.

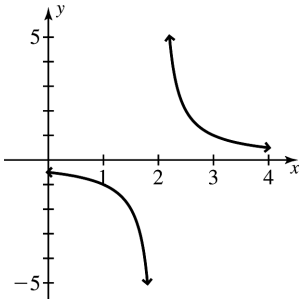
**8.** The vertical asymptotes are given by the roots of $q$ that are not also roots of $p$.

**9.** Evaluate $p$ at $x = a$.

**10.** Continuity from the left means $\lim_{x\to a^-} f(x) = f(a)$. Continuity from the right means $\lim_{x\to a^+} f(x) = f(a)$.

**11.** We can make $f(x)$ as large as we wish by making $x$ sufficiently close to $a$.

**12.** No, if $f(x)$ were continuous on $[1,3]$ then $f(x)$ would attain every value between $-1$ and $1$.




**13.** As $x$ approaches $a$, $g(x)$ gets closer to 0 from the negative side.

# Chapter 2 Test Bank Answers

**1.** 50 **2.** 90 **3.** $-2$ **4.** $-3$

**5.** $2a$ **6.** $-2a$ **7.** $2a$ **8.** $\frac{1}{2}$

**9.** $-\frac{1}{25}$ **10.** $-\frac{1}{20}$ **11.** $-8$

**12.** a. 10 b. 10 c. 10

**13.** a. 4 b. 4 c. 4

**14.** $-2$ **15.** $\frac{1}{4}$ **16.** $\frac{1}{2}$

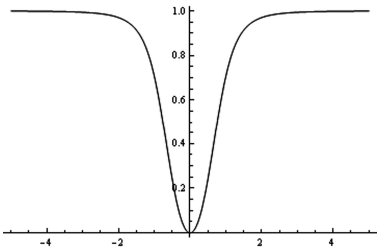
**17.** $\lim_{V\to 0^+}\sqrt[3]{\frac{3V}{4\pi}} = 0$; This result means that as the volume of a sphere gets arbitrarily small, then the radius of the same sphere also approaches zero.

**18.** $\infty$ **19.** $-3$ **20.** $\lim_{x\to\infty} f(x) = \lim_{x\to-\infty} f(x) = 0$ **;** horizontal asymptote at $y = 0$

**21.** $\lim_{x\to\infty} f(x) = 2$ and $\lim_{x\to-\infty} f(x) = -2$ ; horizontal asymptotes at $y = \pm 2$

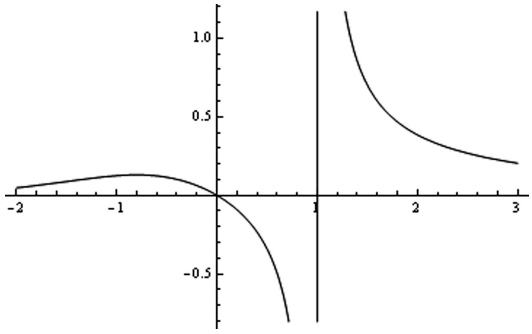
**22.** a. no vertical asymptote, horizontal asymptote at $y = 1$

b.




**23.** a. vertical asymptote at $x = 1$, horizontal asymptote at $y = 0$

b. The hand-drawn sketch should show the vertical asymptote at $x = 1$ as a dashed line (rather than the solid line shown in the figure).




**24.** continuous

**25.** continuous

**26.** $a = 5$

**27.** a. $a = 4$, $b = 1$

b. $a = 4$, $b \neq 1$

**c.** $a \neq 4$, $b = 1$