

Stewart Essential Calc 2ET ch01sec04

MULTIPLE CHOICE

1. Find the limit $\lim_{k \rightarrow -1} (k^4 - k^3 - 4k + 6)$.

- a. 6
- b. 12
- c. -1
- d. -12

ANS: B PTS: 1 DIF: Easy REF: 1.4.3
MSC: Bimodal NOT: Section 1.4

2. Evaluate the limit.

$$\lim_{x \rightarrow 1} (x+4)^3(x^2-9)$$

- a. -990
- b. -189
- c. -1000
- d. 135
- e. -1010

ANS: C PTS: 1 DIF: Medium REF: 1.4.4
MSC: Bimodal NOT: Section 1.4

3. Find the limit.

$$\lim_{x \rightarrow 3} \frac{x^2 + 3x - 18}{x - 3}$$

- a. 0
- b. 9
- c. 18
- d. 11
- e. 5

ANS: B PTS: 1 DIF: Medium REF: 1.4.11
MSC: Bimodal NOT: Section 1.4

4. Find the limit $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x - 3}$, if it exists.

- a. 5

- b. 3
- c. Does not exist
- d. 2

ANS: A PTS: 1 DIF: Medium REF: 1.4.13
MSC: Bimodal NOT: Section 1.4

5. Find the limit $\lim_{x \rightarrow 2} \frac{x-1}{x^2-4x+7}$.

- a. -1
- b. $\frac{1}{3}$
- c. $\frac{1}{7}$
- d. 1

ANS: B PTS: 1 DIF: Easy REF: 1.4.14
MSC: Bimodal NOT: Section 1.4

6. Evaluate the limit, if it exists.

$$\lim_{h \rightarrow 0} \frac{(x-h)^7 - x^7}{h}$$

- a. $-7x^6$
- b. 1
- c. -7
- d. $7x^6$
- e. does not exist

ANS: A PTS: 1 DIF: Medium REF: 1.4.17
MSC: Bimodal NOT: Section 1.4

7. Find the limit $\lim_{x \rightarrow 0} \frac{\sqrt{x+14} - \sqrt{14}}{x}$, if it exists.

- a. $\frac{\sqrt{14}}{2}$
- b. $\frac{\sqrt{14}}{14}$

c. Does not exist

d. $\frac{\sqrt{14}}{28}$

ANS: D

PTS: 1

DIF: Medium

REF: 1.4.21

MSC: Bimodal

NOT: Section 1.4

NUMERIC RESPONSE

1. Find the limit.

$$\lim_{t \rightarrow 5} \frac{t^2 - 25}{t^3 - 125}$$

ANS: $\frac{2}{15}$

PTS: 1

DIF: Medium

REF: 1.4.5

MSC: Numerical Response

NOT: Section 1.4

2. Evaluate the limit.

$$\lim_{x \rightarrow 3} \left(\frac{x^3 - 7}{x^2 - 2} \right)$$

ANS: $\frac{20}{7}$

PTS: 1

DIF: Medium

REF: 1.4.19

MSC: Numerical Response

NOT: Section 1.4

3. Evaluate the limit.

$$\lim_{x \rightarrow -9} |x + 9|$$

ANS: 0

PTS: 1

DIF: Medium

REF: 1.4.37

MSC: Numerical Response

NOT: Section 1.4

SHORT ANSWER

1. Find the limit $\lim_{x \rightarrow 3} \frac{x^2 + x - 12}{x^2 - 9}$, if it exists.

ANS:

$$\frac{7}{6}$$

PTS: 1

DIF: Medium

REF: 1.4.12

MSC: Short Answer

NOT: Section 1.4

2. Find the limit $\lim_{x \rightarrow 0^+} \frac{2 + \sqrt{x}}{\sqrt{x + 49}}$.

ANS:

$$\frac{2}{7}$$

PTS: 1

DIF: Easy

REF: 1.4.23

MSC: Short Answer

NOT: Section 1.4

MULTIPLE CHOICE

1. Choose an equation from the following that expresses the fact that a function f is continuous at the number 6.

a. $\lim_{x \rightarrow 6} f(x) = f(6)$

b. $\lim_{x \rightarrow 6} f(x) = \infty$

c. $\lim_{x \rightarrow 0} f(x) = 6$

d. $\lim_{x \rightarrow 0} f(x) = f(6)$

e. $\lim_{x \rightarrow 6} f(x) = -\infty$

ANS: A PTS: 1 DIF: Medium REF: 1.5.1
MSC: Bimodal NOT: Section 1.5

2. If f and g are continuous functions with $f(9) = 2$ and $\lim_{x \rightarrow 9} [2f(x) - g(x)] = 9$, find $g(9)$.

a. $g(9) = 13$

b. $g(9) = 8$

c. $g(9) = 11$

d. $g(9) = 4$

e. $g(9) = -5$

ANS: E PTS: 1 DIF: Medium REF: 1.5.11
MSC: Bimodal NOT: Section 1.5

3. Use continuity to evaluate the limit.

$$\lim_{x \rightarrow 9\pi} \sin(x + 10 \sin x)$$

a. 9π

b. 0

c. 1

d. -1

e. ∞

ANS: B PTS: 1 DIF: Medium REF: 1.5.28
MSC: Bimodal NOT: Section 1.5

4. Determine where f is discontinuous.

$$f(x) = \begin{cases} \sqrt{-x} & \text{if } x < 0 \\ 11 - x & \text{if } 0 \leq x < 11 \\ (11 - x)^2 & \text{if } x > 11 \end{cases}$$

- a. -11 only
- b. 0 and -11
- c. 11 only
- d. 0 and 11
- e. 0 only

ANS: D PTS: 1 DIF: Medium REF: 1.5.31
MSC: Bimodal NOT: Section 1.5

5. For what value of the constant c is the function f continuous on $(-\infty, \infty)$?

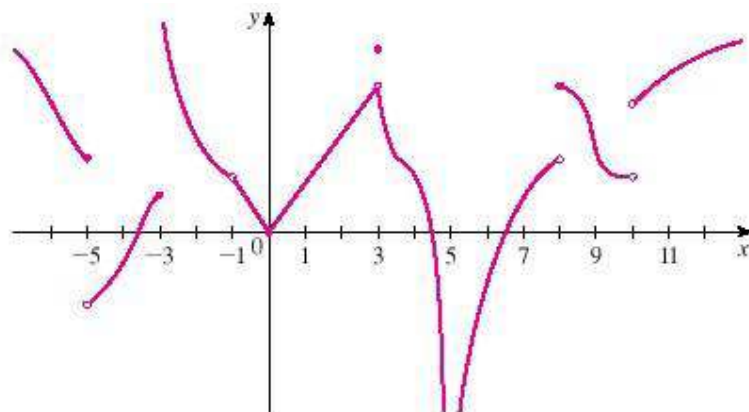
$$f(x) = \begin{cases} cx + 7 & \text{for } x \leq 2 \\ cx^2 - 5 & \text{for } x > 2 \end{cases}$$

- a. $c = 1$
- b. $c = -6$
- c. $c = 6$
- d. $c = -2$
- e. $c = 2$

ANS: C PTS: 1 DIF: Medium REF: 1.5.33
MSC: Bimodal NOT: Section 1.5

NUMERIC RESPONSE

1. For $x = 5$ determine whether f is continuous from the right, from the left, or neither.



ANS: neither

PTS: 1 DIF: Medium
MSC: Numerical Response

REF: 1.5.3b
NOT: Section 1.5

2. Determine where f is discontinuous.

$$f(x) = \begin{cases} \sqrt{-x} & \text{if } x < 0 \\ 5 - x & \text{if } 0 \leq x < 5 \\ (5 - x)^2 & \text{if } x > 5 \end{cases}$$

ANS: at 0 and 5

PTS: 1 DIF: Medium
MSC: Numerical Response

REF: 1.5.16
NOT: Section 1.5

MULTIPLE CHOICE

1. Let $F(x) = \frac{x^3 - 1}{|x - 1|}$. Find the following limits.

$$\lim_{x \rightarrow 1^+} F(x), \quad \lim_{x \rightarrow 1^-} F(x)$$

- a. 3 and 1
- b. 3 and -3
- c. both 1
- d. 3 and -1
- e. both 3

ANS: B

PTS: 1

DIF: Medium

REF: 1.6.13

MSC: Bimodal

NOT: Section 1.6

2. Find the limit.

$$\lim_{x \rightarrow \infty} \frac{7x - 2}{5x + 5}$$

- a. $\frac{2}{7}$
- b. $\frac{2}{5}$
- c. $\frac{5}{2}$
- d. $\frac{7}{5}$
- e. $\frac{5}{7}$

ANS: D

PTS: 1

DIF: Easy

REF: 1.6.19

MSC: Bimodal

NOT: Section 1.6

3. Find the limit.

$$\lim_{x \rightarrow \infty} (4x^2 - 7x^4)$$

- a. 5
- b. ∞
- c. -6
- d. $-\infty$
- e. 6

ANS: D

PTS: 1

DIF: Easy

REF: 1.6.32

MSC: Bimodal

NOT: Section 1.6

4. Find the vertical asymptotes of the function.

$$y = \frac{4x^2 + 1}{3x - 4x^2}$$

a. $x = 3$

b. $x = \frac{4}{3}$

c. $x = 0, \frac{4}{3}$

d. $x = -\frac{4}{3}$

e. None of these

ANS: E

PTS: 1

DIF: Medium

REF: 1.6.35

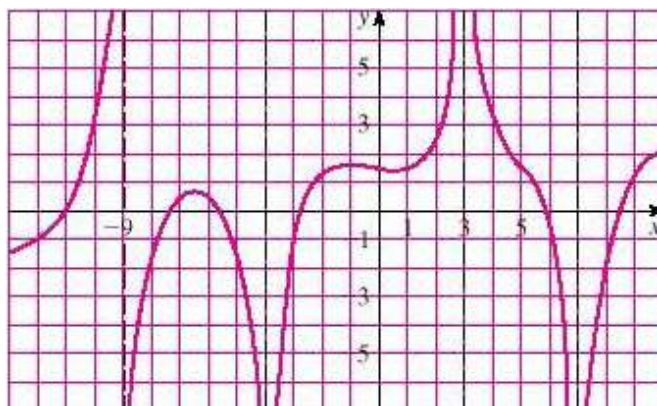
MSC: Bimodal

NOT: Section 1.6

NUMERIC RESPONSE

1. For the function f whose graph is shown, state the following.

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

ANS: $-\infty$

PTS: 1

DIF: Medium

REF: 1.6.1d

MSC: Numerical Response

NOT: Section 1.6