

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the range of the function.

1) $f(x) = 7 - x^2$

A) $(-\infty, 7]$

B) $(-\infty, \infty)$

C) $[-\sqrt{7}, \sqrt{7}]$

D) $[7, \infty)$

2) $f(x) = \frac{10}{4 - x}$

A) $(-\infty, 4) \cup (4, \infty)$

B) $(0, \infty)$

C) $(-\infty, \infty)$

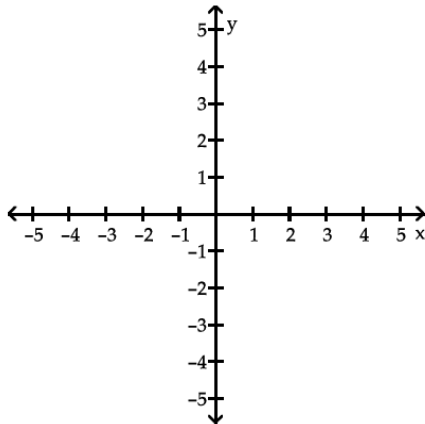
D) $(-\infty, 0) \cup (0, \infty)$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Graph the function and determine if it has a point of discontinuity at $x = 0$. If there is a discontinuity, tell whether it is removable or non-removable.

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

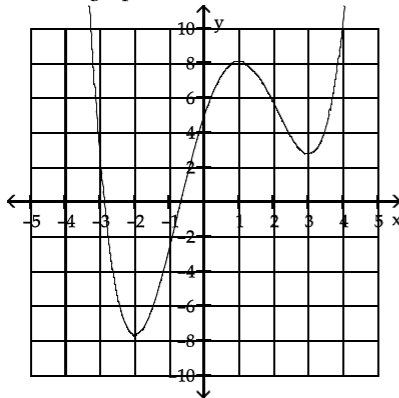
4) $f(x) = \frac{|x + 4|}{x}$



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Solve the problem.

5) Use the graph of f to estimate the local maximum and local minimum.



A) Local maximum: approx. 8.08; local minima: approx. -7.67 and 2.75

B) No local maximum; local minimum: approx. -7.67

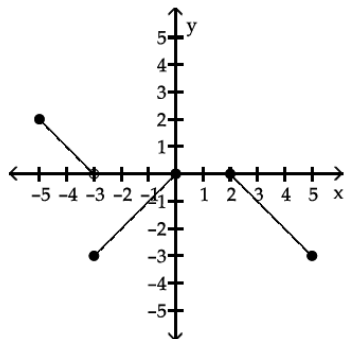
C) Local maximum: ∞ ; local minima: -2 and 3

D) Local maximum: 1; local minima: -2 and 3



Determine the intervals on which the function is increasing, decreasing, and constant.

6)



- A) Increasing on $(-5, -3)$ and $(2, 5)$; Decreasing on $(-3, 0)$; Constant on $(0, 2)$
- B) Increasing on $(-3, -1)$; Decreasing on $(-5, -2)$ and $(2, 4)$; Constant on $(-1, 2)$
- C) Increasing on $(-3, 1)$; Decreasing on $(-5, -3)$ and $(0, 5)$; Constant on $(1, 2)$
- D) Increasing on $(-3, 0)$; Decreasing on $(-5, -3)$ and $(2, 5)$; Constant on $(0, 2)$

Identify intervals on which the function is increasing, decreasing, or constant.

7) $f(x) = x^3 - x^2 + 2$

- A) Increasing: $(0, 0.67)$; decreasing: $(-\infty, 0)$ and $(0.67, \infty)$
- B) Increasing: $(-\infty, 0)$ and $(0.67, \infty)$; constant: $(0, 0.67)$
- C) Increasing: $(-\infty, 0)$ and $(0.67, \infty)$; decreasing: $(0, 0.67)$
- D) Increasing: $(-\infty, -2)$ and $(2, \infty)$; decreasing: $(-2, 2)$

Determine if the function is bounded above, bounded below, bounded on its domain, or unbounded on its domain.

8) $2^x + 7$

- A) Bounded below
- B) Bounded above
- C) Bounded
- D) Unbounded

9) $y = 8x - x^3$

- A) Bounded below
- B) Bounded
- C) Unbounded
- D) Bounded above

Solve the problem.

10) Estimate graphically the local maximum and local minimum of $f(x) = x\sqrt{x+2}$.

- A) Local maximum: -0.35 ; local minimum: -1.09
- B) No local maximum; local minimum: -0.35
- C) No local maximum; local minimum: -1.09
- D) Local maximum: -0.35 ; no local minimum

Determine algebraically whether the function is even, odd, or neither even nor odd.

11) $f(x) = -8x^4 - 4x - 5$

A) Even

B) Odd

C) Neither

12) $f(x) = 8\sqrt[3]{x}$

A) Neither

B) Even

C) Odd

13) $f(x) = 6$

A) Odd

B) Even

C) Neither

14) $f(x) = \sqrt{x^2 + 16}$

A) Odd

B) Even

C) Neither

Find the asymptote(s) of the given function.

15) $h(x) = \frac{(x-6)(x+1)}{x^2-4}$ vertical asymptotes(s)

A) $x = 6, x = -1$

B) $x = -6, x = 1$

C) $x = 2, x = -2$

D) None

16) $f(x) = \frac{8x^2+5}{8x^2-5}$ horizontal asymptotes(s)

A) $y = 1$

B) $y = -5$

C) $y = 5$

D) None

17) $f(x) = 1.1^x$ horizontal asymptotes(s)

A) $y = 0$

B) $x = 0$

C) $y = 1.1$

D) None

18) $g(x) = \frac{x+2}{x^2-5}$ horizontal asymptotes(s)

A) $y = 0$

B) $y = 5$

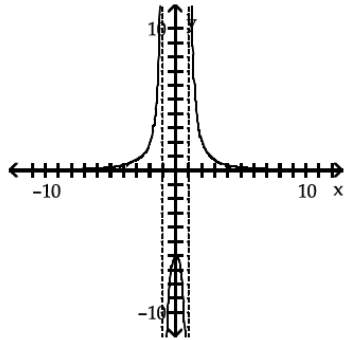
C) None

D) $y = -2$

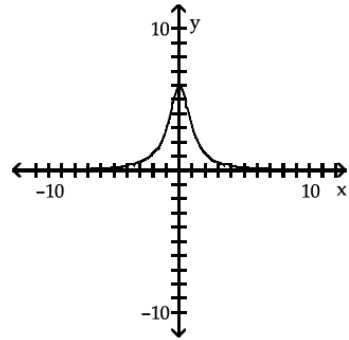
Match the equation with the appropriate graph.

19) $f(x) = \frac{6x}{x^2 - 1}$

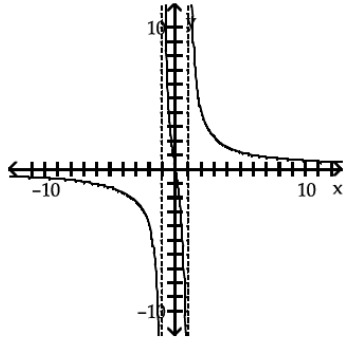
A)



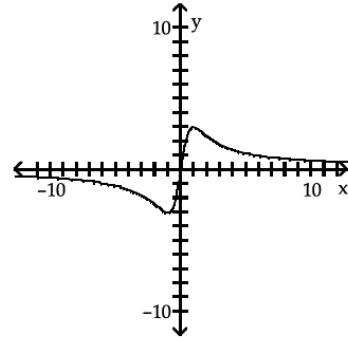
B)



C)

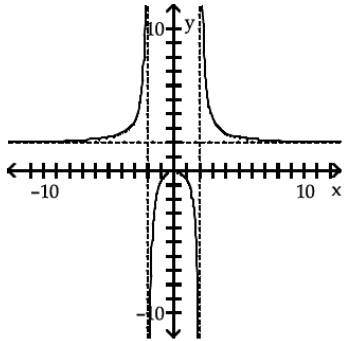


D)

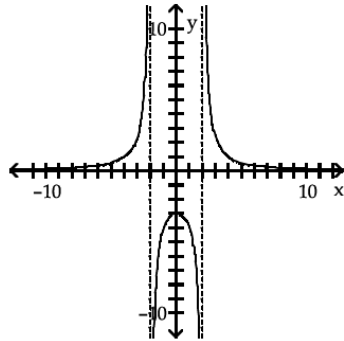


20) $f(x) = \frac{x^3}{x^2 - 4}$

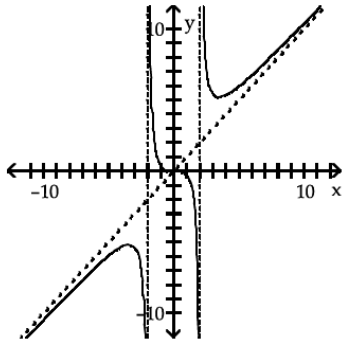
A)



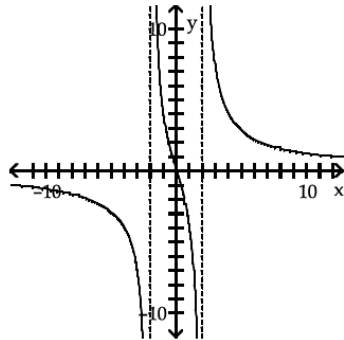
B)



C)



D)



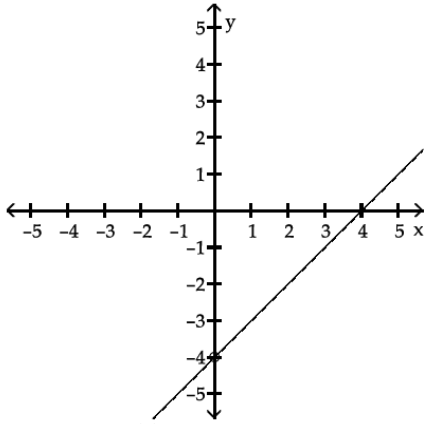
Answer Key

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) A
- 2) D

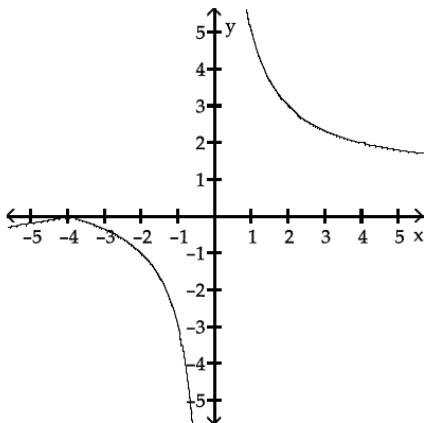
SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

3)



Yes; removable

4)



Yes; non-removable

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 5) A
- 6) D
- 7) C
- 8) A
- 9) C
- 10) C
- 11) C
- 12) C
- 13) B
- 14) B
- 15) C
- 16) A
- 17) A
- 18) A
- 19) C
- 20) C