

1. Determine the domain of the function.

5b

$$f(x) = \frac{4x - 9}{4x + 36}$$

The domain is . (Type your answer in interval notation.)

2. List all the asymptotes of the following function, then graph the function.

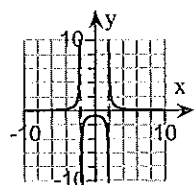
$$f(x) = \frac{2x}{x^2 - 9}$$

Choose the correct asymptotes below.

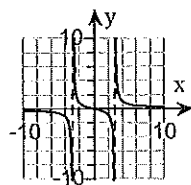
- ☐ A. $x = 2, x = -2$
☐ B. $x = 2, x = -2, y = 0$
☐ C. $x = 3, x = -3, y = 0$
☐ D. $x = 3, x = -3$

Choose the correct graph below.

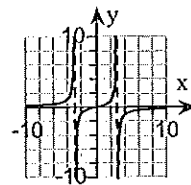
☐ A.



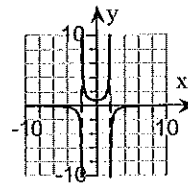
☐ B.



☐ C.



☐ D.



3. Find the vertical asymptote of the graph of the function.

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

The equation of the vertical asymptote is
 $x = \square$.

4. Determine the horizontal asymptote of the graph of the function.

$$f(x) = \frac{3x^3 + 2}{4x^3 - 5}$$

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. The horizontal asymptote is $y = \blacksquare$.
(Type an integer or a simplified fraction.)
- ☐ B. There is no horizontal asymptote.

5. Determine the horizontal asymptote of the graph of the following function.

$$f(x) = \frac{x^2 - 6}{6x^4 + 5}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The horizontal asymptote is $y = \blacksquare$.
(Type an integer or a fraction.)
- ☐ B. There is no horizontal asymptote.

6. Determine the horizontal asymptote of the graph of the function.

$$f(x) = \frac{x^3 - 2x^2 + x - 5}{x^2 - 11}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

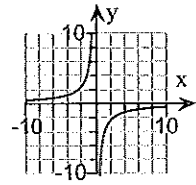
- ☐ A. The horizontal asymptote is $y = \blacksquare$.
(Type an integer or a fraction.)
- ☐ B. There is no horizontal asymptote.

7. Graph.

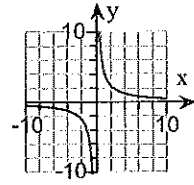
$$h(x) = -\frac{5}{x^2}$$

Which of the following is the graph of $y = h(x)$?

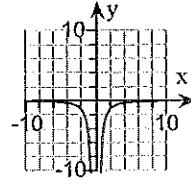
☐ A.



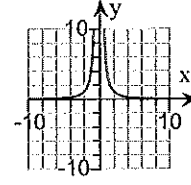
☐ B.



☐ C.



☐ D.

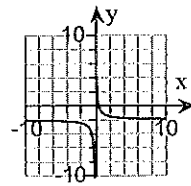


8. Graph the following function.

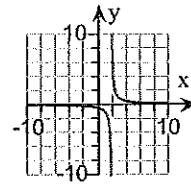
$$y = \frac{1}{x-2}$$

Choose the correct graph from the choices on the right.

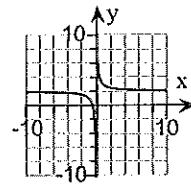
☐ A.



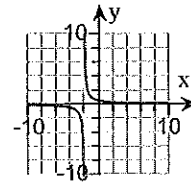
☐ B.



☐ C.



☐ D.



Find the domain, any asymptotes, and the x- and y-intercepts of $f(x)$. Then graph the function.

$$f(x) = \frac{5x + 3}{x}$$

What is the domain of $f(x)$?

☐ A. $(-\infty, 5) \cup (5, \infty)$

☐ B. $(-\infty, 0) \cup (0, \infty)$

☐ C. $(-\infty, \infty)$

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. The x-intercept is .

(Type an ordered pair. Type an exact answer.)

☐ B. There is no x-intercept.

Select the correct choice below and fill in any answer boxes within your choice.

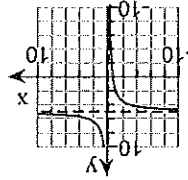
☐ A. The y-intercept is .

(Type an ordered pair. Type an exact answer.)

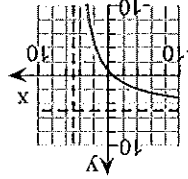
☐ B. There is no y-intercept.

Choose the correct graph on the right.

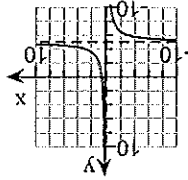
☐ A.



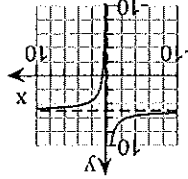
☐ C.



☐ B.



☐ D.



10.

List the domain and the x- and y-intercepts of the following function. Graph the function. Be sure to label all the asymptotes.

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

What is the domain of the function?

(Type your answer in interval notation.)

Find the x- and y-intercepts. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

(Type an ordered pair, using integers or fractions. Use a comma to separate answers as needed.)

☐ A. There is no y-intercept. The x-intercept(s) is/are .

☐ B. There is no x-intercept. The y-intercept is .

☐ C. The x-intercept(s) is/are . The y-intercept is .

☐ D. There are no x- and y-intercepts.

Find the vertical asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The vertical asymptote(s) is/are $x =$.

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

☐ B. There are no vertical asymptotes.

Find the horizontal asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The horizontal asymptote is $y =$.

(Type an integer or a simplified fraction.)

☐ B. There is no horizontal asymptote.

Find the oblique asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The oblique asymptote is $y =$.

(Type an integer or a simplified fraction.)

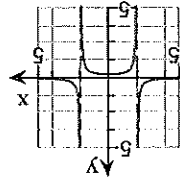
☐ B. There is no oblique asymptote.

Choose the correct graph of the function below.

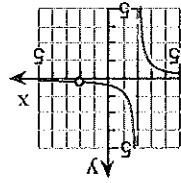
10.

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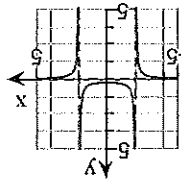
☐ A.



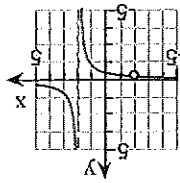
☐ B.



☐ C.



☐ D.



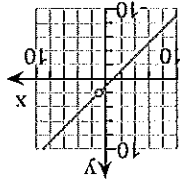
11.

Consider the function.

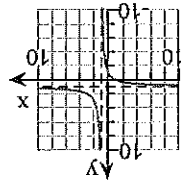
$$f(x) = \frac{x^2 - 1}{x - 1}$$

Choose the graph of the function.

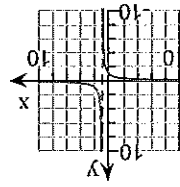
☐ A.



☐ B.



☐ C.



12.

List the domain and the x- and y-intercepts of the following function. Graph the function. Be sure to label all the asymptotes.

$$f(x) = \frac{x - 6}{x + 4}$$

What is the domain of the function?

(Type your answer in interval notation.)

Find the x- and y-intercepts. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

(Type an ordered pair, using integers or fractions. Use a comma to separate answers as needed.)

☐ A. There is no y-intercept. The x-intercept(s) is/are .

☐ B. The x-intercept(s) is/are . The y-intercept is .

☐ C. There is no x-intercept. The y-intercept is .

☐ D. There are no x- and y-intercepts.

Find the vertical asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The vertical asymptote(s) is/are $x =$.

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

☐ B. There are no vertical asymptotes.

Find the horizontal asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The horizontal asymptote is $y =$.

(Type an integer or a simplified fraction.)

☐ B. There is no horizontal asymptote.

Find the oblique asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

☐ A. The oblique asymptote is $y =$.

(Type an integer or a simplified fraction.)

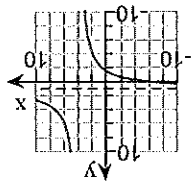
☐ B. There is no oblique asymptote.

Choose the correct graph of the function below.

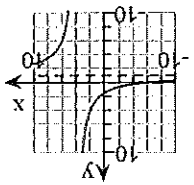
12.

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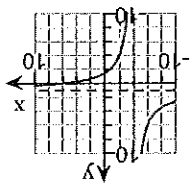
☐ A.



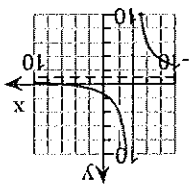
☐ B.



☐ C.



☐ D.



13. List the domain and the x- and y-intercepts of the following function. Graph the function. Be sure to label all the asymptotes.

$$f(x) = \frac{x - 5}{x^2 - 2x - 35}$$

What is the domain of the function?

(Type your answer in interval notation.)

Find the x- and y-intercepts. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

(Type an ordered pair, using integers or fractions. Use a comma to separate answers as needed.)

- ☐ A. There is no y-intercept. The x-intercept(s) is/are .
- ☐ B. The x-intercept(s) is/are . The y-intercept is .
- ☐ C. There is no x-intercept. The y-intercept is .
- ☐ D. There are no x- and y-intercepts.

Find the vertical asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The vertical asymptote(s) is/are $x =$.
- (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. There are no vertical asymptotes.

Find the horizontal asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The horizontal asymptote is $y =$.
- (Type an integer or a simplified fraction.)
- ☐ B. There is no horizontal asymptote.

Find the oblique asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

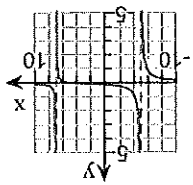
- ☐ A. The oblique asymptote is $y =$.
- (Type an integer or a simplified fraction.)
- ☐ B. There is no oblique asymptote.

Choose the correct graph of the function below.

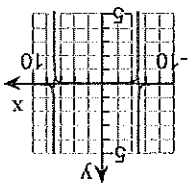
13.

(cont.)

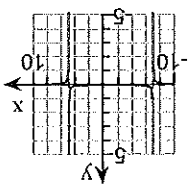
☐ A.



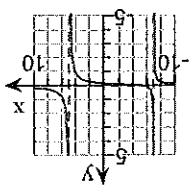
☐ B.



☐ C.



☐ D.



14.

List the domain and the x- and y-intercepts of the following function. Graph the function. Be sure to label all the asymptotes.

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

What is the domain of the function?

(Type your answer in interval notation.)

Find the x- and y-intercepts. Select the correct choice below and, if necessary, fill in the answer box(es) to complete your choice.

(Type an ordered pair, using integers or fractions. Use a comma to separate answers as needed.)

- ☐ A. There is no x-intercept. The y-intercept is .
- ☐ B. The x-intercept(s) is/are . The y-intercept is .
- ☐ C. There is no y-intercept. The x-intercept(s) is/are .
- ☐ D. There are no x- and y-intercepts.

Find the vertical asymptote(s). Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ☐ A. The vertical asymptote(s) is/are $x =$.
- (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- ☐ B. There are no vertical asymptotes.

Find the horizontal asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

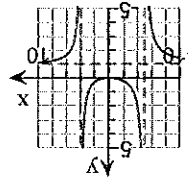
- ☐ A. The horizontal asymptote is $y =$.
- (Type an integer or a simplified fraction.)
- ☐ B. There is no horizontal asymptote.

Find the oblique asymptote. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

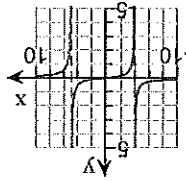
- ☐ A. The oblique asymptote is $y =$.
- (Type an integer or a simplified fraction.)
- ☐ B. There is no oblique asymptote.

Choose the correct graph of the function below.

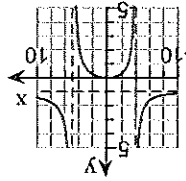
☐ A.



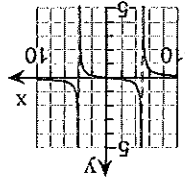
☐ B.



☐ C.



☐ D.



15.

The function $N(t) = \frac{0.7t + 1200}{6t + 5}$, $t \geq 15$, gives the body concentration $N(t)$, in parts per million, of a certain dosage of medication after time t , in hours.

- a) What does $N(t)$ approach as t goes to ∞ ?
b) Explain the meaning of the answer to part a) in terms of the application.

$N(t)$ approaches _____ as t goes to ∞ .
☐ A. 240
☐ B. 0
☐ C. 0.12
☐ D. ∞

What does this indicate about the body concentration?

- ☐ A. It never decreases to 0.
☐ B. It becomes infinitely large.
☐ C. It begins at 240.
☐ D. It decreases to 0.

16. For the function $f(x) = x^2 + 2x - 35$ solve the following.

$$f(x) \leq 0$$

Select the correct choice below and fill in the answer box within your choice.

☐ A. The solution is $\{\text{■}\}$. (Use a comma to separate answers as needed.)

☐ B. The solution is ■ . (Type your answer in interval notation.)

17. For the function $g(x) = \frac{x-8}{x-1}$, solve the following inequality.

$$g(x) \geq 0$$

Select the correct choice below and fill in the answer box within your choice.

☐ A. The solution is $\{\text{■}\}$. (Use a comma to separate answers as needed.)

☐ B. The solution is ■ . (Type your answer in interval notation.)

18. For the function $h(x) = \frac{3x}{(x+7)(x-8)}$, solve the following inequality.

$$h(x) \geq 0$$

Select the correct choice below and fill in the answer box within your choice.

☐ A. The solution is ■ . (Type your answer in interval notation.)

☐ B. The solution is $\{\text{■}\}$. (Use a comma to separate answers as needed.)

19. For the function $g(x) = x^5 - 9x^3$ solve the following.

$$g(x) < 0$$

Select the correct choice below and fill in the answer box within your choice.

☐ A. The solution is $\{\text{■}\}$. (Use a comma to separate answers as needed.)

☐ B. The solution is ■ . (Type your answer in interval notation.)

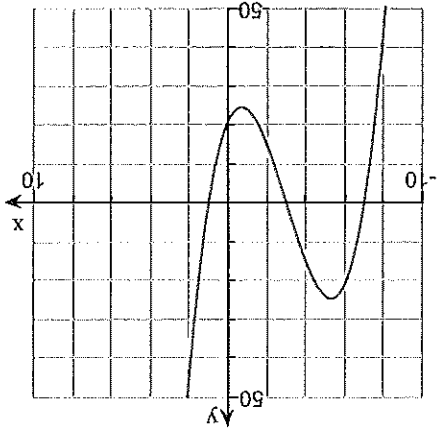
20.

A related function is graphed. Solve the given inequality.

$$x^3 + 9x^2 < -11x + 21$$

The solution is .

(Type your answer in interval notation.)



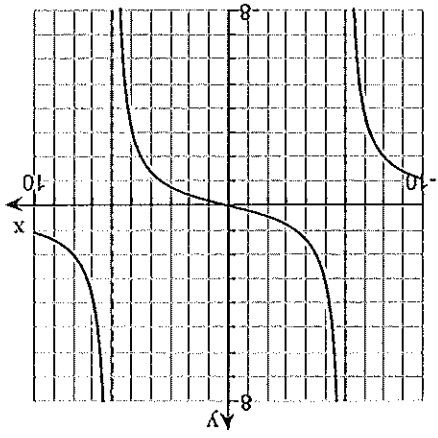
21.

A related function is graphed. Solve the given inequality.

$$\frac{7x}{x^2 - 36} \geq 0$$

The solution is .

(Type your answer in interval notation.)



Solve.

23.

Solve the following inequality.

$$25 - x^2 \leq 0$$

The solution set is .

(Type your answer in interval notation. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed.)

24. Solve.

$$\frac{x-2}{x-4} \geq \frac{x+4}{x+5}$$

The solution set is .

(Type your answer in interval notation.)

25. The temperature T , in degrees Fahrenheit, of a person during an illness is given by the function $T(t) = \frac{5t}{t^2 + 1} + 98.6$, where t = time, in hours. Find the interval over which the temperature was over 100° .

The interval is between and hours.

(Enter the lower number first. Round to the nearest hundredth.)

