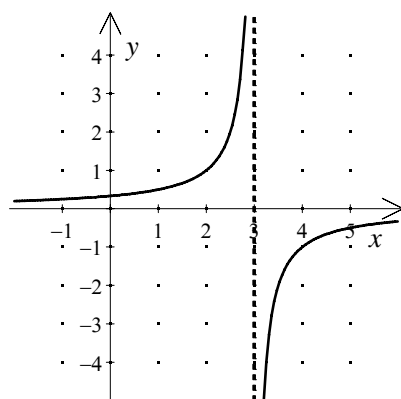


NAME: \_\_\_\_\_

1. Which points are restricted from the domain of the function graphed below?



2. Find the vertical asymptote(s) of the graph of

$$f(x) = \frac{x^2 - 9}{(x+3)(x-1)}.$$

- [A]  $x = 1, -3$       [B]  $x = 1$   
[C]  $y = 1$       [D]  $y = 1, -1$

3. Find the vertical asymptote(s) of the graph of

$$f(x) = \frac{x^2 - 4}{(x+2)(x+9)}.$$

- [A]  $y = 1$       [B]  $y = 1, -1$   
[C]  $x = -9, -2$       [D]  $x = -9$

4. Find the horizontal asymptote of the graph of

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

- [A]  $x = 0$       [B]  $y = 3$   
[C]  $x = 2$       [D]  $y = 0$

5. Write the equations of the horizontal asymptote and vertical asymptote of the graph

$$y = \frac{4x}{x-8}.$$

6. What are the asymptotes of the function

$$y = -\frac{3}{(x+1)} - 2?$$

- [A]  $x = -1, y = -2$       [B]  $x = -1, y = -3$   
[C]  $x = 1, y = 2$       [D]  $x = 1, y = -2$

7. Graph the function on your graphing calculator and find the asymptotes.

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

8. What are the discontinuities of the function  $y = \frac{(x-1)(x-2)(x+3)}{(x+1)(x-2)}$ ? Classify them as asymptotes or removable discontinuities.

NAME: \_\_\_\_\_

9. A shirt-making company has been in business five years. This table shows the number of employees and the number of shirts produced each year.

Year in Business	Employees	Shirts
1	5	4,000
2	6	6,000
3	7	8,000
4	8	10,000

Write a function  $E(x)$  that models the number of employees after  $x$  years of business. Then write a function  $S(x)$  that models the number of shirts made after  $x$  years in business. Then write a rational function  $A(x)$  for the average number of shirts made per employee after  $x$  years in business. Identify the discontinuities of the rational function.

10. Compare the quantity in Column A with the quantity in Column B.

Column A

the number of asymptotes of

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

Column B

the number of asymptotes of

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

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.

[1]  $x = 3$  \_\_\_\_\_

[2]  $B$  \_\_\_\_\_

[3]  $D$  \_\_\_\_\_

[4]  $D$  \_\_\_\_\_

[5]  $y = 4; x = 8$  \_\_\_\_\_

[6]  $A$  \_\_\_\_\_

[7]  $x = 2$  and  $x = -2$  are vertical asymptotes. \_\_\_\_\_

$x = -1$  is an asymptote and  $x = 2$  is a  
[8] removable discontinuity. \_\_\_\_\_

$E(x) = x + 4;$

$S(x) = 2000(x + 1)$  or  $2000x + 2000;$

[9]  $A(x) = \frac{2000x + 2000}{x + 4}; x \neq -4$  \_\_\_\_\_

[10]  $A$  \_\_\_\_\_