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| **Student:** Cole Lamers<br>**Date:** 06/21/19 | **Instructor:** Kelly Galarneau<br>**Course:** CA&T Internet (70263) Galarneau | **Assignment:** 3.6 Rational Functions |

1. The line $y = k$ is a horizontal asymptote of f if $f(x) \to k$ as $x \to$ ____ or as $x \to$ ____.

   The line $y = k$ is a horizontal asymptote of f if $f(x) \to k$ as $x \to \infty$ or as $x \to -\infty$.

2. Every rational function has at least one vertical asymptote. State whether this statement is true or false.

   Choose the correct answer below.

   - [x] False
   - [ ] True

3. Watch the video and then solve the problem given below.

   Click here to watch the video.[1]

   Find the domain of the rational function $f(x) = \dfrac{x-1}{x^2+x-6}$.

   Choose the correct answer below.

   - [x] **A.** $(-\infty,-3)\cup(-3,2)\cup(2,\infty)$
   - [ ] **B.** $(-\infty,-2)\cup(-2,1)\cup(1,3)\cup(3,\infty)$
   - [ ] **C.** $(-\infty,-3)\cup(-3,1)\cup(1,2)\cup(2,\infty)$
   - [ ] **D.** $(-\infty,-2)\cup(-2,3)\cup(3,\infty)$

   1: http://mediaplayer.pearsoncmg.com/assets/QGTsILraBpL2RC241rNG7Ai0mnx7Ee_P?clip=1

4. Find the domain of the rational function.

   $f(x) = \dfrac{10-x}{x+1}$

   The domain is $(-\infty,-1)\cup(-1,\infty)$. (Type your answer in interval notation.)

5. Find the domain of the rational function.

   $\dfrac{v-5}{v^2+4}$

   The domain of the function is $(-\infty,\infty)$.

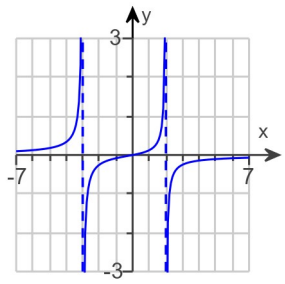
6. Find the domain of the given rational function.

   $f(x) = \dfrac{2x}{x^2-11x+28}$

   Domain of f = $(-\infty,4)\cup(4,7)\cup(7,\infty)$
   (Type your answer in interval notation.)

7. Use the graph of the rational function to complete the following statement.

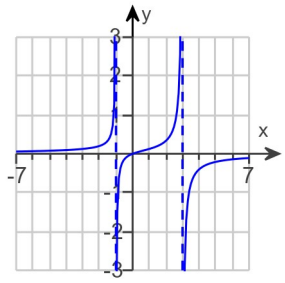
As $x \to 2^+$, $f(x) \to$ ____.




As $x \to 2^+$, $f(x) \to$ $-\infty$.

8. Use the graph of the rational function to complete the following statement.

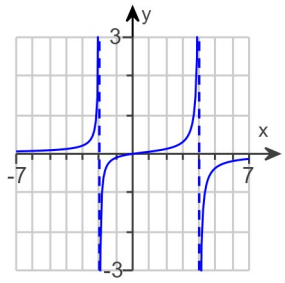
As $x \to -1^+$, $f(x) \to$ ____.




As $x \to -1^+$, $f(x) \to$ $-\infty$.

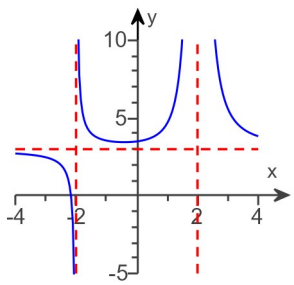
9. Use the graph of the rational function to complete the following statement.

As $x \to \infty$, $f(x) \to$ ____.




As $x \to \infty$, $f(x) \to$ 0.

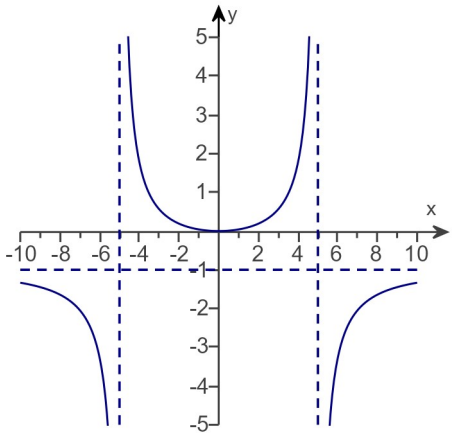
10. Use the graph of the rational function f(x) shown to the right to find its domain.




Select the correct choice below, and fill in the answer boxes with your choice, if necessary.

- **A.** $(-\infty,$ ____ $) \cup ($ ____ $,\infty)$
- **B.** $(-\infty,$ ____ $] \cup ($ ____ , ____ $) \cup [$ ____ $,\infty)$
- **C.** $(-\infty,$ $-2$ $) \cup ($ $-2$ , $2$ $) \cup ($ $2$ $,\infty)$
- **D.** set of all real numbers

11. What are the vertical asymptotes of the graph of f?

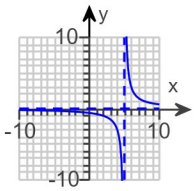


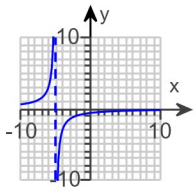

The vertical asymptote(s) is/are $x = -5, x = 5$.
(Type an equation. Use a comma to separate answers as needed.)

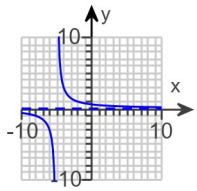
12. Graph the rational function as a translation of $f(x) = \frac{1}{x}$. Identify the vertical and horizontal asymptotes and state the domain and range.

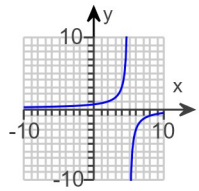
$$f(x) = \frac{3}{x-5}$$

Choose the correct graph below.

**A.**



**B.**



**C.**



**D.**



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

**A.** $x =$ 5
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

**B.** There is no vertical asymptote.

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

**A.** $y =$ 0
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

**B.** There is no horizontal asymptote.

The domain of f(x) is $(-\infty,5)\cup(5,\infty)$.
(Type your answer in interval notation.)

The range of f(x) is $(-\infty,0)\cup(0,\infty)$.
(Type your answer in interval notation.)

13. Watch the video and then solve the problem given below.

Click here to watch the video.[2]

Find all vertical asymptotes of the rational function $f(x) = \frac{x-1}{x^2-25}$.

Select all that apply.

- [ ] **A.** $x = 25$
- [x] **B.** $x = 5$
- [ ] **C.** $x = -25$
- [ ] **D.** $x = 1$
- [ ] **E.** $x = 0$
- [x] **F.** $x = -5$
- [ ] **G.** $x = -1$
- [ ] **H.** There are no vertical asymptotes.

2: http://mediaplayer.pearsoncmg.com/assets/QGTsILraBpL2RC241rNG7Ai0mnx7Ee_P?clip=3

14. Find the vertical asymptotes, if any, of the graph of the rational function.

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

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

- (●) **A.** The vertical asymptote(s) is(are) $x = 5$.
  (Type an equation. Use commas to separate answers as needed.)
- ( ) **B.** There are no vertical asymptotes.

15. Find the vertical asymptotes, if any, of the graph of the following rational function.

$$f(x) = \frac{(x+1)(2x-2)}{(x-5)(x+6)}$$

Select the correct choice below and fill in the answer boxes within your choice, if necessary.

- (●) **A.** The vertical asymptote(s) is/are $x = 5, x = -6$.
  (Type an equation. Use a comma to separate answers as needed.)
- ( ) **B.** The graph has no vertical asymptotes.

16. Find the vertical asymptotes, if any, of the graph of the following rational function.

$$f(x) = \frac{x}{x^2+7}$$

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

- ( ) **A.** The vertical asymptote(s) is(are) .
  (Type an equation. Use a comma to separate answers as needed.)
- (●) **B.** There are no vertical asymptotes.

17. Watch the video and then solve the problem given below.

Click here to watch the video.[3]

Find the horizontal asymptote of the graph of the rational function $f(x) = \frac{6 - 5x}{3x - 7}$.

The horizontal asymptote is $y =$ $\frac{-5}{3}$. (Type an integer or a fraction.)

3: http://mediaplayer.pearsoncmg.com/assets/QGTsILraBpL2RC241rNG7Ai0mnx7Ee_P?clip=5

18. Find the horizontal asymptote, if any, of the graph of the rational function.

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

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

**A.** The horizontal asymptote is $y = -\frac{3}{2}$.

(Type an equation. Simplify your answer. Use integers or fractions for any numbers in the equation.)

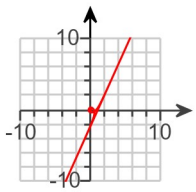
**B.** There is no horizontal asymptote.

19. Graph f(x).

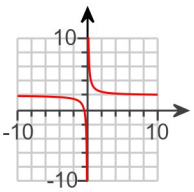
$$f(x) = \frac{1}{x + 2}$$

Choose the correct graph.

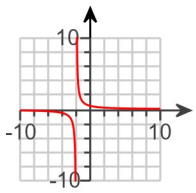
**A.**




**B.**




**C.**




**D.**