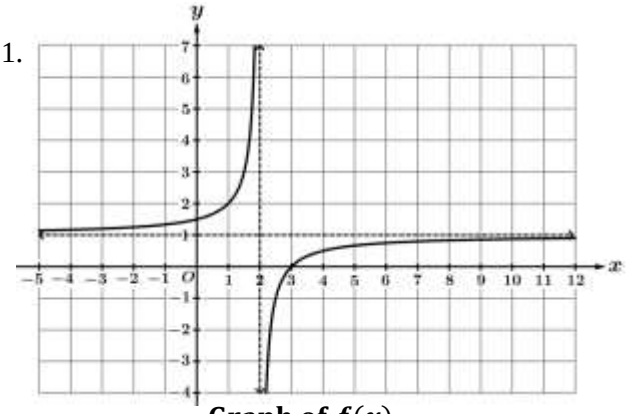
Directions: For each of the following rational functions, write limit statements to describe the left and right end behaviors.

1.

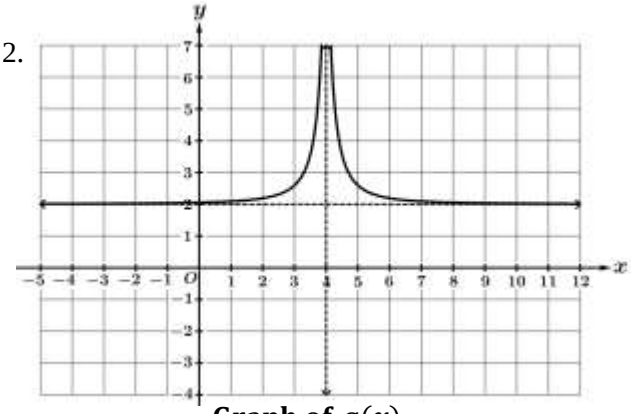


Graph of $f(x)$

Left: _____

Right: _____

2.



Graph of $g(x)$

Left: _____

Right: _____

3. $h(x) = \dfrac{2x^2 - 2x + 1}{3x^2 + 5x + 7}$

Left: _____

Right: _____

4. $k(x) = \dfrac{2x(x-3)}{(x+2)^2(x-1)}$

Left: _____

Right: _____

5. $r(x) = \dfrac{-2x^4 + 3x^2 + x - 1}{5x^2 + 2x + 3}$

Left: _____

Right: _____

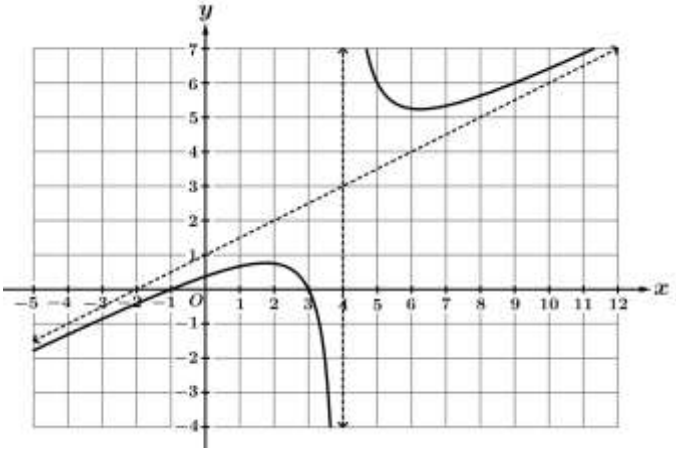
6. $m(x) = \dfrac{3(x-1)^2(x+5)}{(2x+3)^2}$

Left: _____

Right: _____

Directions: Write a limit statement describing the output values for the following graphs and verbal descriptions of the input values.

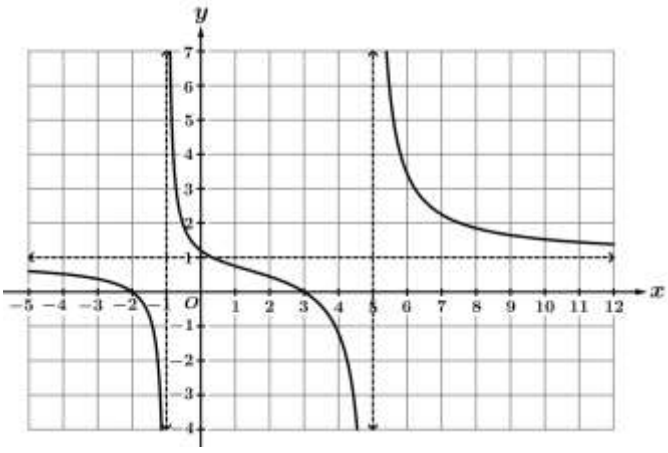
7. The input values decrease without bound



Graph of $f(x)$

7. Limit Statement: _____

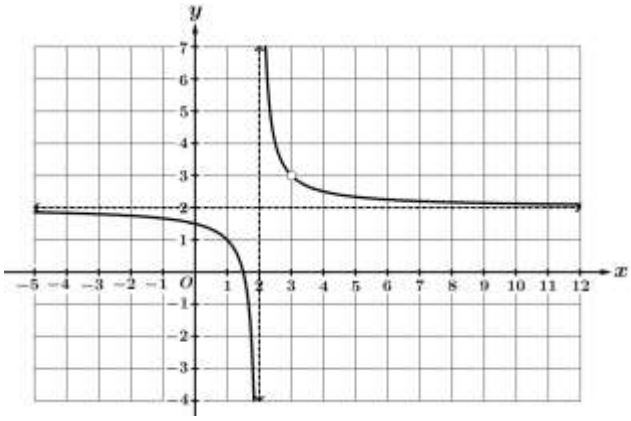
8. The input values increase without bound



Graph of $g(x)$

8. Limit Statement: _____

Directions: The graphs of the functions h and k are given below. Use the graphs to find the following limits.



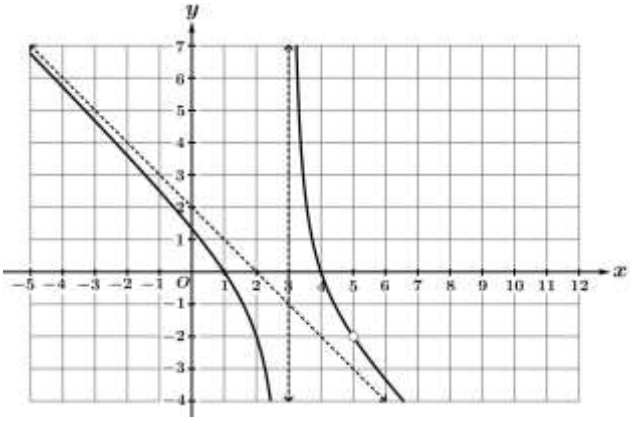
Graph of $h(x)$

9. $\lim_{x\to 2^-} h(x) =$

10. $\lim_{x\to 2^+} h(x) =$

11. $\lim_{x\to 3^-} h(x) =$

12. $\lim_{x\to 3^+} h(x) =$



Graph of $k(x)$

13. $\lim_{x\to 5^-} k(x) =$

14. $\lim_{x\to 3^+} k(x) =$

15. $\lim_{x\to -\infty} k(x) =$

16. $\lim_{x\to \infty} k(x) =$

Directions: For each of the following, write the left and right limit statements for $f(x)$ as x approaches 1.

17. $f(x) = \dfrac{(x-1)(x+5)}{(x-1)(x+2)}$

Left:

Right:

18. $f(x) = \dfrac{(x-2)(x-4)}{(x-1)(x+2)}$

Left:

Right:

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

Left:

Right:

Directions: For each of the following rational functions, determine and label any values of x where the graph has a hole or vertical asymptote.

20. $y = \dfrac{(x+3)(x-2)}{(x+3)^2(x-2)}$

21. $k(x) = \dfrac{(x+7)(x+2)^3}{(x+1)(x+2)^2}$

22. $r(x) = \dfrac{x^3 - x^2}{x^2 + 2x + 1}$

Directions: Solve the following inequalities. Write your answers using interal notation.

23. $\dfrac{x-3}{x+2} \leq 0$

24. $\dfrac{(x-1)^2(x+2)}{(x+1)} > 0$

25. $\dfrac{x^2 - x - 12}{x^2} \geq 0$

26. $\dfrac{-2x(x-3)^2}{(x+2)(x-4)^2} < 0$