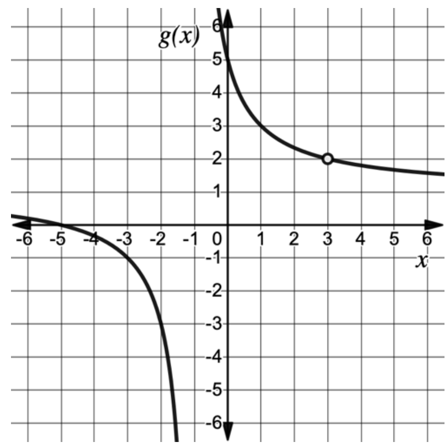
The "Hole" Truth

Yesterday we looked at a particular rational function that represented the concentration of anesthesia in a patient's body. Today we're going to look at some other features of rational functions.



1. The graph of $g(x) = \frac{(x+5)(x-3)}{(x-3)(x+1)}$ is shown to the right.

   a. Find $\lim_{x\to\infty} g(x)$.

   b. Complete the table of values.

x	$g(x)$
-5	
-1	
0	
3	
4	

2. The graph of g has one x-intercept. What is it?

3. For which values of x is g not defined?

4. Describe what is happening on the graph at $x = -1$. Why do you think this happens?

5. As x gets closer and closer to $x = -1$ from the left what is happening to the values of g?

6. As x gets closer and closer to $x = -1$ from the right, what is happening to the values of g?

7. Describe what is happening on the graph at $x = 3$. Why do you think this happens?

8. As x gets closer and closer to $x = 3$ from the left what is happening to the values of g?

9. As x gets closer and closer to $x = 3$ from the right, what is happening to the values of g?

10. Make a conjecture about how you can use the factored form of a rational function to determine where the function will have x-intercepts, holes, and vertical asymptotes.

Lesson 2.6 – Graphing Rational Functions

QuickNotes

Check Your Understanding

1. For $f(x) = \frac{x^2-16}{x^2+3x-4}$, find the following:
    a. Zeros:
    b. Y-intercept:
    c. Equation of any vertical asymptotes:
    d. Ordered pair(s) of any holes:
    e. Equation of any horizontal asymptotes:

2. Evaluate $f(x)$ at an x-value to the left and right of the vertical asymptote, to determine whether f is going to ∞ or $-\infty$.

3. Use all your work above to sketch the graph of $f(x)$.