Problem 1 – Introduction

1. How do the graphs of the two given equations compare?

2. What do the graphic results tell us about the two functions?

3. How are the denominators in f2 related to the denominator of f1?

4. What is the LCD (least common denominator) for $\dfrac{7x+3}{x^2-9} = \dfrac{A}{x+3} + \dfrac{B}{x-3}$?

5. What is the result of multiplying $\dfrac{7x+3}{x^2-9} = \dfrac{A}{x+3} + \dfrac{B}{x-3}$ through by the LCD?

6. Substitute in a convenient number for *x* and solve for *A*. What value did you obtain for *A*?

7. Similarly substitute in a convenient number for *x* and solve for *B*. What value did you obtain for *B*?

8. Now substitute the values you found for both *A* and *B* into the equation shown in Question 4 to show the equivalent rational function and sum of partial fractions.

9. How do your results for Question 8 support your answer to the Question 2 regarding what the graphs of the functions f1 and f2 tell us about the two functions?

Problem 2 – Practice

10. Express the rational function, $f(x) = \dfrac{7x-4}{x^2+x-6}$, as a sum of partial fractions.

11. Does the graph of the initial function and your sum of partial fractions verify your results? Explain your reasoning.

Problem 3 – The Next Level

12. Express the rational function, $\dfrac{5x-7}{4x^2-8x-12}$, as a sum of partial fractions.

13. Does the graph of the initial function and your sum of partial fractions verify your results? Explain you reasoning.

Additional Practice Problems

Represent each of the following rational functions as a sum of partial fractions. Verify your results graphically.

14. $f(x) = \dfrac{-7x-11}{x^2+4x+3}$

15. $f(x) = \dfrac{2x+42}{x^2+2x-24}$

16. $f(x) = \dfrac{x}{x^2+2x-8}$