1. Simplify. State the excluded values.   <u>FINAL ANSWERS MUST BE BOXED!</u>

$$f(x) = \frac{x^2 - 36}{x^2 + 11x + 30}$$

2. Simplify. State the excluded values.

$$f(x) = \frac{x^2 + 9x + 8}{x^2 + 3x - 40}$$

3. Multiply. Simplify $\dfrac{x^2 + 7x - 18}{x^2 + 10x + 16} \cdot \dfrac{x^2 + 4x + 4}{x^2 - 4}$

4. Multiply. Simplify $\dfrac{x^2 - 11x + 30}{x^2 - 25} \cdot \dfrac{x^2 + 8x + 15}{3x^2 - 18x}$

5. Divide. Simplify $\dfrac{x^2 - 49}{x^2 - 81} \div \dfrac{x^2 + 10x + 21}{x^2 - 6x - 27}$

6. Add: $\dfrac{x + 5}{x^2 + 9x + 20} + \dfrac{x - 7}{x + 5}$

7. Add: $\dfrac{x}{x + 3} + \dfrac{x - 6}{x^2 - 9}$

9. Subtract: $\dfrac{x-6}{x^2+3x+2} - \dfrac{x-4}{x^2-1}$

10. Subtract: $\dfrac{7x}{12x^4y^2} - \dfrac{5}{18xy^3}$

11. State the Vertical Asymptote(s), Horizontal Asymptote(s), and hole(s), if applicable.

$y = \dfrac{x+4}{x^2+7x+12}$ V.A.:   H.A.:   Hole:

12. State the Vertical Asymptote(s), Horizontal Asymptote(s), and hole(s), if applicable.

$y = \dfrac{x^2+9x+14}{x^2+11x+28}$ V.A.:   H.A.:   Hole:

13. State the Vertical Asymptote(s), Horizontal Asymptote(s), and hole(s), if applicable.

$y = \dfrac{4x^2-12}{x^2-6x-16}$ V.A.:   H.A.:   Hole:

14. Write the domain, in interval notation, of the function in #12?

15. Write the domain, in interval notation, of the function in #13?