

**Simplify Rational Expressions**

Simplify each rational expression. Remember to factor first!!

1.  $\frac{3h^2-3h-18}{h^2-5h+6}$

2.  $\frac{k^2-5k-14}{k^2-49}$

3.  $\frac{2x^2+9x+9}{x^2-6x-27}$

**Multiply and Divide Rational Expressions**

Simplify each rational expression. Pay attention to whether you are multiplying or dividing!!

4.  $\frac{x^2+3x-10}{x^2-4} \cdot \frac{x+2}{x^2-9}$

5.  $\frac{b^2-2b-8}{b^2+3b+2} \cdot \frac{4b+4}{b^2-b-12}$

6.  $\frac{3m-15}{4} \div \frac{m^2-25}{2m-10}$

7.  $\frac{x^2+6x+5}{x^2+2x-8} \cdot \frac{x^2-5x+6}{x^2+2x-15}$

8.  $\frac{a^2-a-2}{a^2+6a+5} \div \frac{2a^2-3a-2}{4a^2-1}$

9.  $\frac{c^2-3c-10}{c^2-4} \div \frac{c^2-25}{c^2+2c-15}$

**Asymptotes, Holes, and Domain.**

Determine the vertical asymptotes, holes, domain, and horizontal asymptotes of each rational function.

10.  $f(x) = \frac{4x+8}{x^2-6x-16}$

11.  $f(x) = \frac{x^2-16}{x+4}$

12.  $f(x) = \frac{6x^2-4x-2}{x^2-8x+15}$

|        |  |
|--------|--|
| VA     |  |
| Hole   |  |
| Domain |  |
| HA     |  |

|        |  |
|--------|--|
| VA     |  |
| Hole   |  |
| Domain |  |
| HA     |  |

|        |  |
|--------|--|
| VA     |  |
| Hole   |  |
| Domain |  |
| HA     |  |

**Add Rational Expressions (Common Denominator)**

Simplify each rational expression.

13.  $\frac{4x}{x^2+2x+1} + \frac{4}{x^2+2x+1}$

14.  $\frac{-v^2+3}{v^2+5v-14} + \frac{2v^2-52}{v^2+5v-14}$

15.  $\frac{w+3}{w^2-64} + \frac{1}{w^2-64}$