Graphing Rational Functions: Vertical Asymptotes

Steps:
After you look for holes...
1. Set the denominator = 0.
2. Solve for x.

Write vertical asymptotes as x = #

Examples: Find the vertical asymptotes.

1. $f(x) = \frac{5}{x-3}$

$x-3=0$

$x=3$

2. $f(x) = \frac{2x}{x^2-7x+12}$ ← factor

12 / -3 / -4 / -7

$f(x) = \frac{2x}{(x-3)(x-4)}$

$x-3=0 \quad x-4=0$

$x=3 + x=4$

3. $f(x) = \frac{x^2-x-6}{x^2+3x+2}$ hole

$f(x) = \frac{(x-3)(x+2)}{(x+1)(x+2)}$

$x+1=0$

$x=-1$

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

$f(x) = \frac{2x}{x(x+2)}$ hole at x=0

$f(x) = \frac{2}{x+2}$

$x+2=0$

$x=-2$