**5.5 – Rational Inequalities**

$$f(x) = \frac{\left(x+3\right)(x+1)}{\left(x-2\right)(x+4)}$$

Is f(-5)>0 or <0?

(x+3)

(x+1)

(x-2)

(x+4)



**When is f(x)>0? What are key points on the graph to determine when f(x)>0 or f(x)<0?**

**Example 1:** Solve. 5/(x-2) >0



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|  | x<2 | x>2 |
| (x-2) |  |  |
| 5/(x-2) |  |  |

**Example 2:** Solve (3x+1)/(x-1) <0



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|  | x<-1/3 | -1/3<x<1 | x>1 |
| 3x+1 |  |  |  |
| x-1 |  |  |  |
| (3x+1)/(x-1) |  |  |  |

**Example 3:** If f(x)= (2x+3)/(4x+20), determine when f(x)>0 without graphing

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**Example 4:** Solve $x-3<\frac{4}{x}$

* Move all terms to the left hand side
* Find a common denominator
* Combine the terms
* Factor the numerator (to find the zeros)
* Determine when the denominator = 0 (to find the asymptotes)

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**Example 5:** Solve $\frac{2x}{3x+4}>\frac{x}{x+1}$

* Move all terms to the left hand side
* Find a common denominator
* Combine the terms
* Factor the numerator
* Determine when the denominator =0.

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