Name _____ Date _____

Graphing Rational Functions - Guided Lesson Explanation

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

Step 1) Find the x and y intercept.

x-intercept (y=0)	y-intercept (x=0)
Restated: $\mathbf{0 = \frac{2+2x}{x+2}}$ **x = -1** **(-1, 0)**	**Restated:** $\boldsymbol{f(x) = \frac{2}{2}}$ **y = 1** **(0, 1)**

Step 2) Identify the Vertical Asymptotes

Make the denominator equal to 0. Solve for x.

x + 2 = 0 x = -2

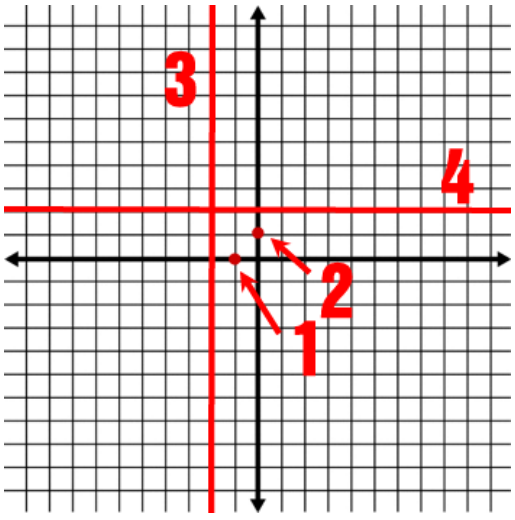
Step 3) Identify the Horizontal Asymptote

Divide the leading coefficients. 2/1 = 2

Step 4) Sum up what we know already on the graph.

1. x-intercept = (-1, 0) 2. y-intercept = (0,1)

3. Vertical Asymptotes = -2 4. Horizontal Asymptote= 2



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Step 5) Pick a number of x-values to plot and work them through.

x-value	Plug into $f(x) = \frac{2+2x}{x+2}$	y-value
-1.5	$\frac{2 + -3}{0.5}$	-2
-3	$\frac{2 + -6}{-3 + 2}$	4
-4	$\frac{2 + -8}{-4 + 2}$	3
-9	$\frac{2 + -18}{-9 + 2}$	2 2/7
2	$\frac{2 + 4}{2 + 2}$	1.5
6	$\frac{2 + 12}{6 + 2}$	2.75
9	$\frac{2 + 18}{9 + 2}$	1 .81

Step 6) Plot all the points and connect them to show curves.