C11 - 7.7 - Linear Reciprocals Notes

$y = x + 4$ Line

$y = \dfrac{1}{x + 4}$ Reciprocal line

Pick a y value, What's one divided by that y value. Put a point on the graph. X value is same as it was.

Solve algebraically: set denominator = 0, 1, -1.

Vertical asymptote (VA): Denominator $= 0$	Invariant points (IP): Denominator $= 1$	Invariant points (IP): Denominator $= -1$
$x + 4 = 0$ $x = -4$	$x + 4 = 1$ $x = -3$	$x + 4 = -1$ $x = -5$
VA: $x = -4$	$(-3, 1)$	$(-5, -1)$

D: $x \neq -4$

1. Graph original
2. Graph VA: Dotted line
3. Graph IP's
4. Graph reciprocal

D: $x \neq -4$

$y = \dfrac{1}{x + 4}$ $y = x + 4$

x	y
-5	-1
-4	0
-3	1

x	$\dfrac{1}{x + 4}$
-100	$-.01$
-5	-1
-4.1	-10
-4.01	-100
-4	UND
-3.99	100
-3.9	10
-3	1
100	$.01$

$y \neq 0$

Close to the vertical asymptote, through the point, close the x-axis/vertical asymptote
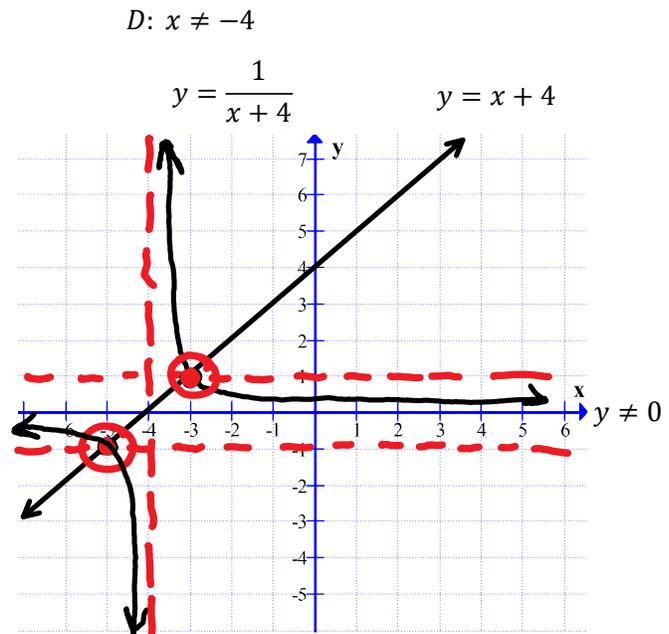
Notice: The invariant points are the intersection of the original and the lines $y = 1, y = -1$

Notice: The vertical asymptote(s) of the reciprocal is the X intercept of the original