

Ch.4b Exponential and Rational Models

In the past, you may have studied negative exponents. They are used to represent variables that are in the denominator of a fraction.

Fraction form	Power form	Fraction form	Power form
$\frac{1}{x^2}$	x^{-2}	$\frac{2}{x}$	$2x^{-1}$
$\frac{3}{x^2}$	$3x^{-2}$	$\frac{2}{3x^3}$	$\frac{2}{3}x^{-3}$
$\frac{1}{2x^2}$	$\frac{1}{2}x^{-2}$	$\frac{4}{x^3}$	$4x^{-3}$
$\frac{1}{x}$	x^{-1}	$\frac{4}{x}$	$4x^{-1}$

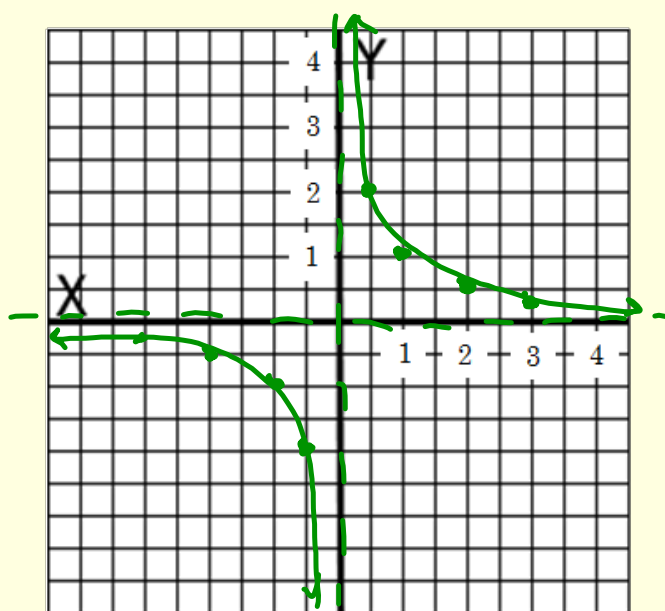
Polynomial functions can also contain terms with negative exponents.

$f(x)$ in Fraction form	$f(x)$ in Power form
$f(x) = 3x^2 + \frac{2}{x}$	$f(x) = 3x^2 + 2x^{-1}$
$f(x) = 2x + \frac{50}{x^2}$	$f(x) = 2x + 50x^{-2}$
$f(x) = 2x^2 + \frac{2000}{x}$	$f(x) = 2x^2 + 2000x^{-1}$
$f(x) = 21 + \frac{79}{x}$	$f(x) = 21 + 79x^{-1}$

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

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



Vertical Asymptote:

$x = 0$

Domain:

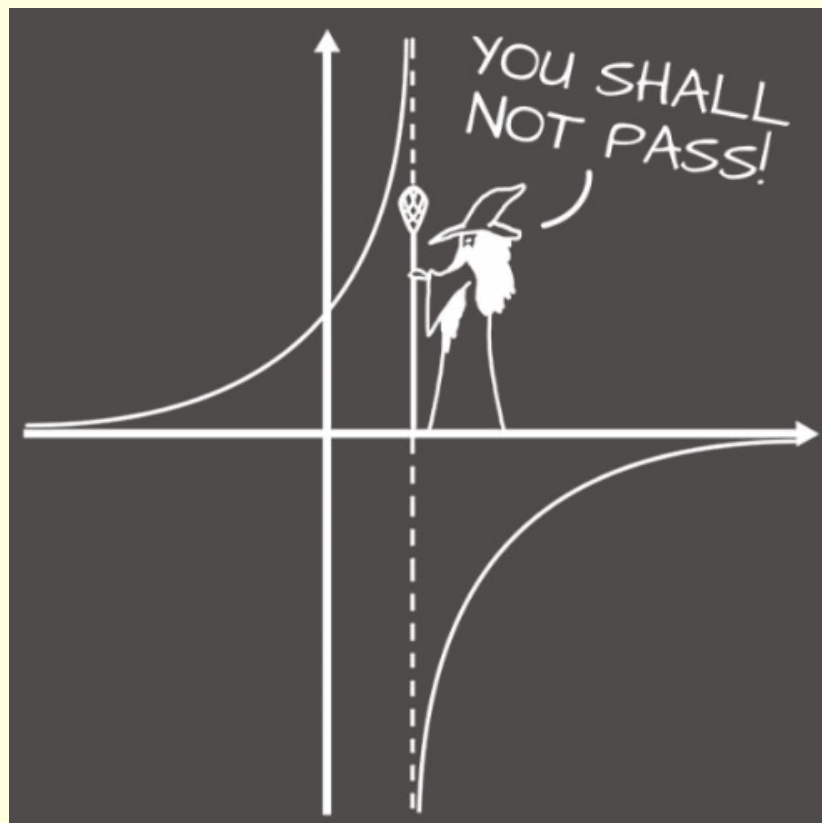
$x \in \mathbb{R}$
 $x \neq 0$

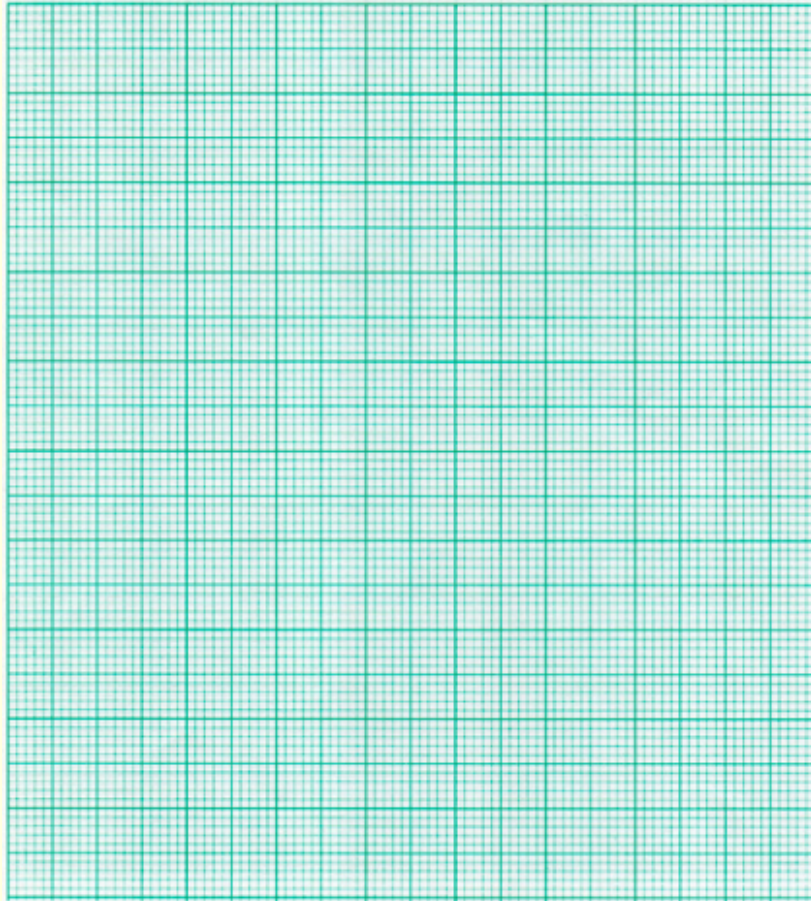
Horizontal Asymptote:

$y = 0$

Range:

$y \in \mathbb{R}$
 $y \neq 0$





Homework Assignment:

page 180:2, 3; page 183:1;
page 185:1, 2