

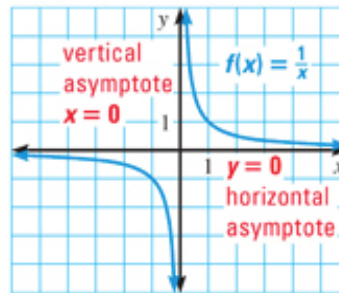
Honors Algebra II

Section 5.2

Graph Simple Rational Functions

Parent Function for Simple Rational Functions

The graph of the parent function $f(x) = \frac{1}{x}$ is a *hyperbola*, which consists of two symmetrical parts called *branches*. The domain and range are all nonzero real numbers.



Any function of the form $g(x) = \frac{a}{x}$ ($a \neq 0$) has the same asymptotes, domain, and range as the function $f(x) = \frac{1}{x}$.

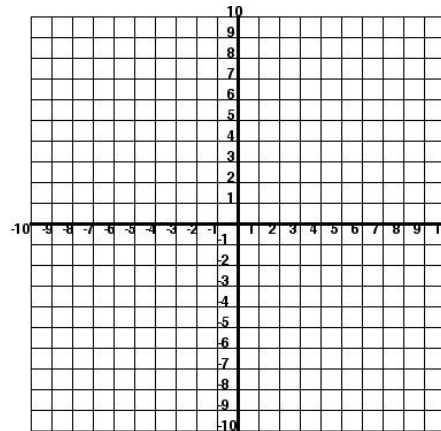
Vertical Asymptote: _____ Horizontal Asymptote: _____

Domain: _____ Range: _____

EXAMPLE 1 Graph the function $y = 6/x$. Compare the graph with the graph of $y = 1/x$.

X	Y

X	Y



Comparison: _____

Graph Translations of Simple Rational Functions: _____

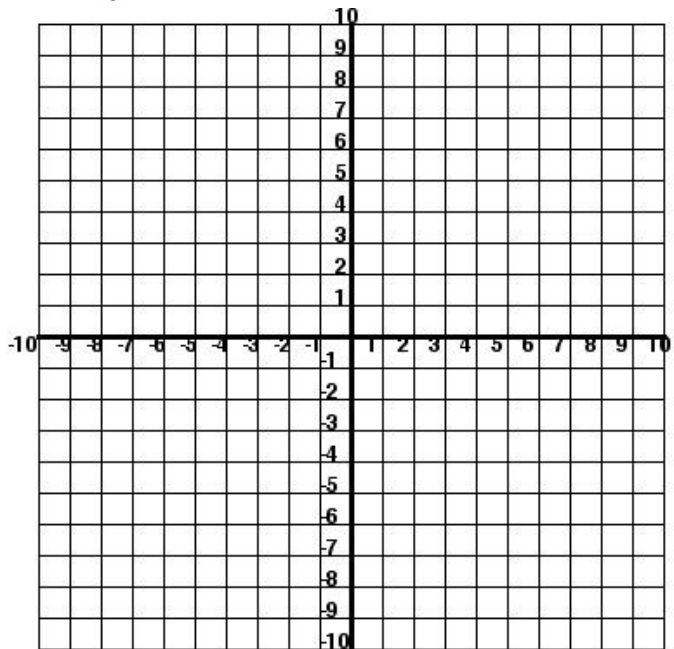
Vertical Asymptote: _____ Horizontal Asymptote: _____

Domain: _____ Range: _____

Example 2 Graph. State the domain and range.

a) $y = \frac{-4}{x+2} - 1$

x	y



VA: _____

HA: _____

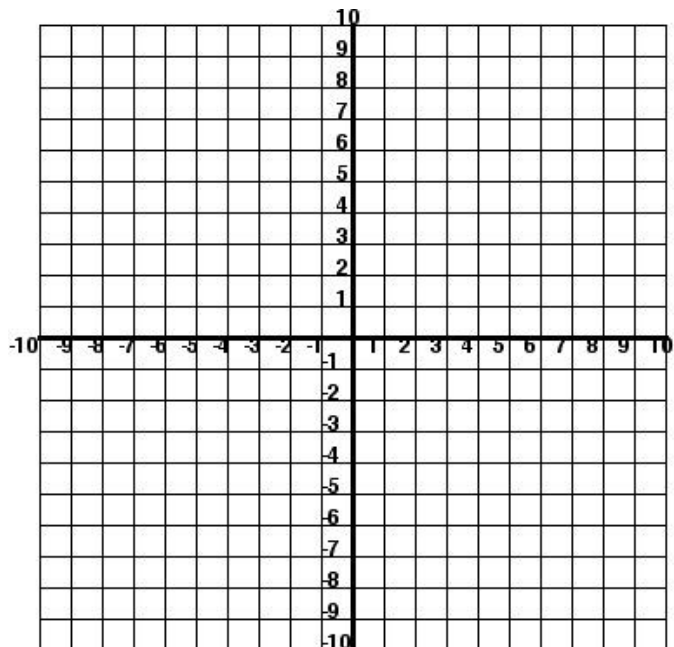
D: _____

R: _____

x	y

b) $y = \frac{8}{x} - 5$

x	y



VA: _____

HA: _____

D: _____

R: _____

x	y

Another Simple Rational Form: $y = \frac{ax + b}{cx + d}$

HA: $= a/c$

EXAMPLE 3 Graph. State the domain and range.

a) $y = \frac{2x + 1}{x - 3}$

a: _____

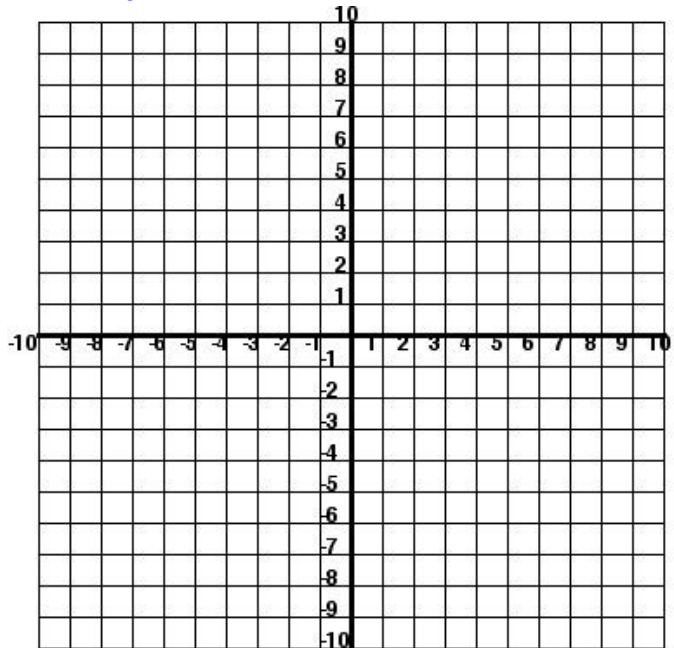
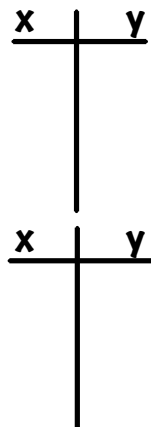
c: _____

VA: _____

HA: _____

D: _____

R: _____



b) $y = \frac{3x - 6}{x + 2}$

a: _____

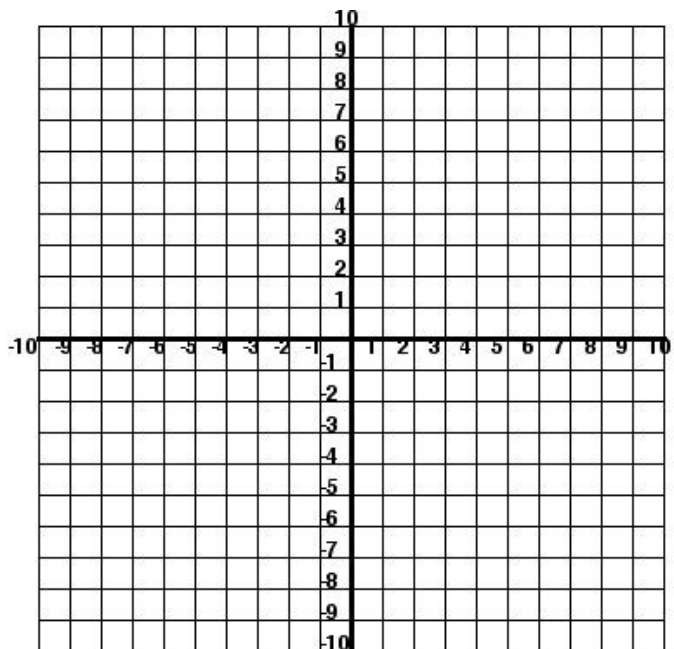
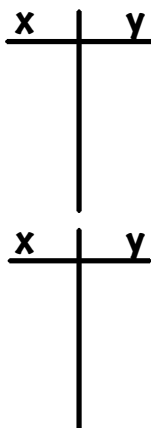
c: _____

VA: _____

HA: _____

D: _____

R: _____



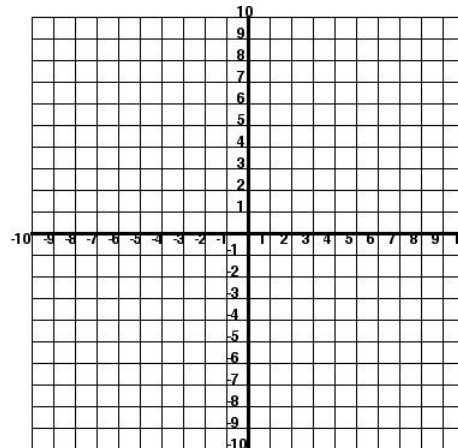
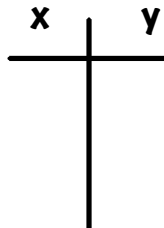
EXAMPLE 4 A 3D printer builds up layers of material to make 3D models. Each deposited layer bonds to the layer below it. A company decides to make small display models of engine components using a 3D printer. The printer costs \$24,000. The material for each model costs \$300.

- a) Write an equation that gives the average cost/model as a function of the number of models printed.
- b) Graph. Estimate how many models must be printed for the average cost/model to fall to \$700.

VA: _____

HA: _____

Estimate: _____



- c) What happens to the average cost as more models are printed?
