

Honors Algebra II

Section 5.3

Graph General Rational Functions

Graphs of Rational Functions: $f(x) = p(x) / q(x)$

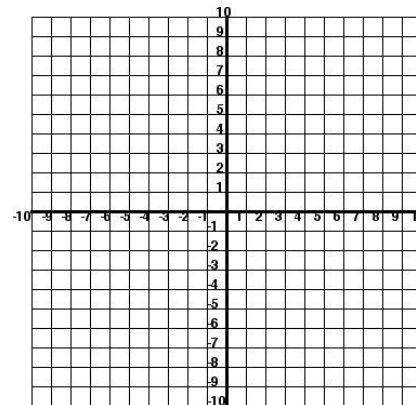
1. **x-intercepts:** real zeros of $p(x)$
2. **vertical asymptote:** each real zero of $q(x)$
3. **horizontal asymptote:** determined by the degrees of $p(x)$ & $q(x)$
 - A. If the degree of the numerator < the degree of the denominator _____
 - B. If the degree of the numerator = the degree of the denominator

 - C. If the degree of the numerator > the degree of the denominator _____

EXAMPLE 1 Graph. State the domain and range.

a) $y = \frac{6}{x^2 + 1}$

1. _____
2. _____
3. _____



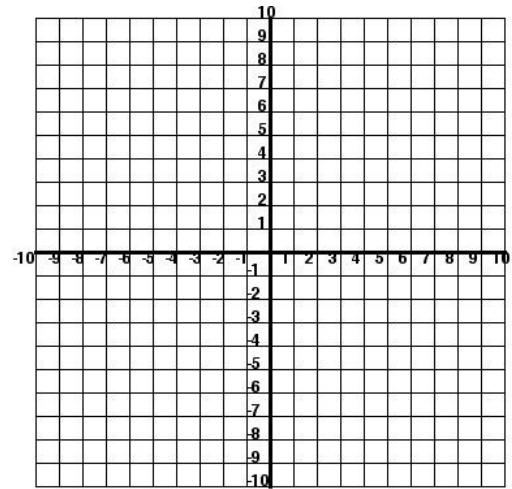
x							
y							

Domain: _____ Range: _____

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

1. _____
2. _____
3. _____

x						
y						



Domain: _____ Range: _____

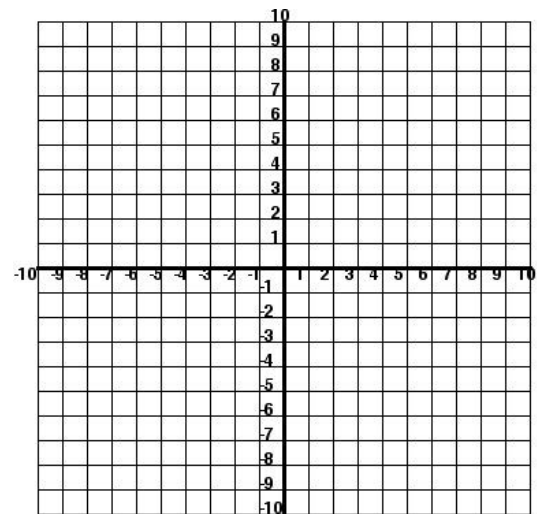
EXAMPLE 2 Graph.

a) $y = \frac{2x^2}{x^2 - 9}$

1. _____
2. _____
3. Degree of Numerator = _____

Degree of Denominator = _____

x	y	x	y	x	y



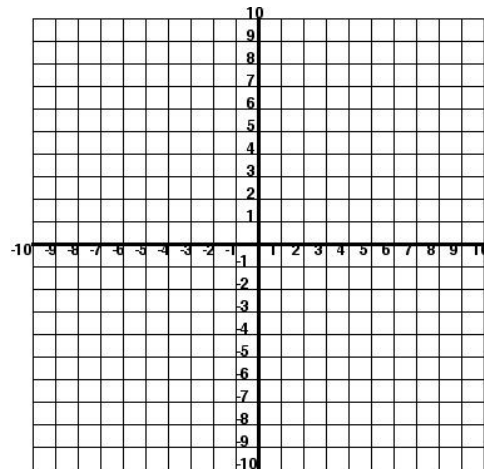
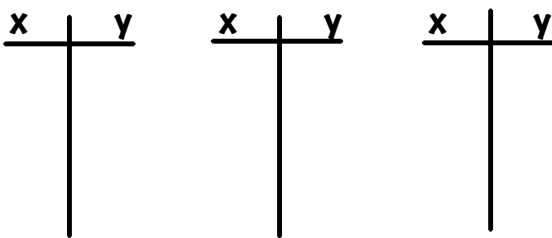
b) $y = \frac{-x^2}{x^2 - 4}$

1. _____

2. _____

3. Degree of Numerator = _____

 Degree of Denominator = _____



EXAMPLE 3 Graph.

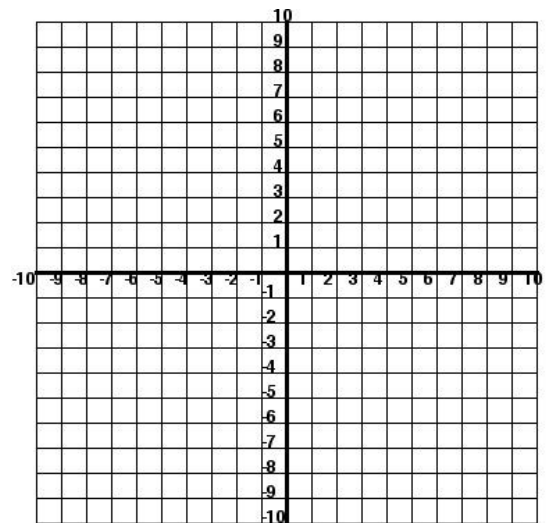
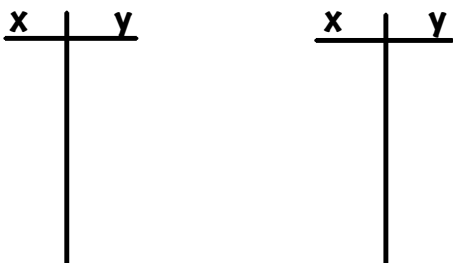
a) $y = \frac{x^2 + 3x - 4}{x - 2}$

1. _____

2. _____

3. Degree of Numerator = _____

 Degree of Denominator = _____



b) $y = \frac{x^2 - 2x + 1}{x + 2}$

1.

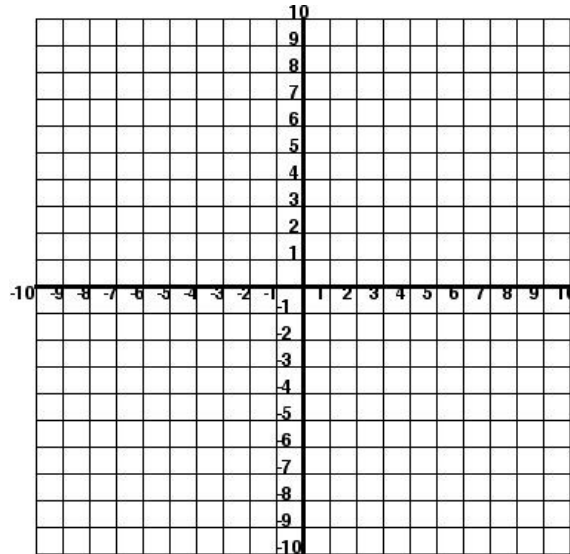
2.

3. Degree of Numerator = _____

Degree of Denominator = _____

x	y

x	y



EXAMPLE 4 A food manufacturer wants to find the most efficient packaging for a can of soup with a volume of 342 cm^3 . Find the dimensions of the can that has this volume and uses the least amount of material possible.

Steps

- 1) Write an equation that gives you the height
- 2) Write a function for the surface area.
- 3) Graph using a graphing calculator. Use the minimum feature to find the minimum value of s .