## Algebra 2

## 7-02 Graphing Rational Functions

## Rational Functions

- Functions written as a $\qquad$ with $x$ in the denominator
- $y=\frac{1}{x}$
- Shape called $\qquad$


## General form

- $y=\frac{a}{x-h}+k$
- $\quad a \rightarrow$ $\qquad$ vertically
- $h \rightarrow$ moves $\qquad$
- $k \rightarrow$ moves $\qquad$
How is $y=\frac{2}{x+3}+4$ transformed from $y=\frac{1}{x}$ ?



## How to find asymptotes

- Vertical asymptote

1. Make the $\qquad$ $=0$ and solve for $\qquad$

- Horizontal asymptote

1. Substitute a $\qquad$ number for $\qquad$ and $\qquad$

- Or

1. Find the degree of $\qquad$
2. Find the degree of $\qquad$ (D)
a. If $\mathrm{N}<\mathrm{D}$, then $\qquad$
b. If $N=D$, then $\qquad$
c. If $\mathrm{N}>\mathrm{D}$, then

Find the asymptotes for $y=\frac{2 x}{3 x-6}$

## Domain

- All $x$ 's except for the $\qquad$ asymptotes


## Range

- All the $y$ 's covered in the graph
- Usually all y's except for $\qquad$ asymptote

1. Find the

Graph $y=\frac{2}{x+3}+4$ and state the domain and range


Rewrite $g(x)=\frac{2 x+5}{x+2}$ in the form $g(x)=\frac{a}{x-h}+k$. Graph the function. Describe the graph of $g$ as a transformation of the graph of $f(x)=\frac{a}{x}$.


Rewrite $g(x)=\frac{5 x+6}{x+1}$ in the form $g(x)=\frac{a}{x-h}+k$. Graph the function. Describe the graph of $g$ as a transformation of the graph of $f(x)=\frac{a}{x}$.


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