

Notes Unit 1.5 Graphing Rational Functions

A **rational function** is a function in the form $\frac{N(x)}{D(x)}$ where $N(x)$ and $D(x)$ are polynomials.

DOMAIN AND X-INTERCEPTS OF A RATIONAL FUNCTION:

- DOMAIN: all x values where the denominator is not 0.
- X-INTERCEPTS: all x values where the numerator is 0.
- Y-INTERCEPTS: value at $f(0)$ or when $x = 0, y = ?$.

ASYMPTOTES ON THE GRAPH OF A RATIONAL FUNCTION: (vertical and horizontal)

- a line that a graph comes very close to but never touches

Let $f(x) = \frac{ax^N}{bx^D}$, which is in simplified form

1. The graph of $f(x)$ has a vertical asymptote when $D(x) = 0$.
 - set the denominator equal to zero and solve

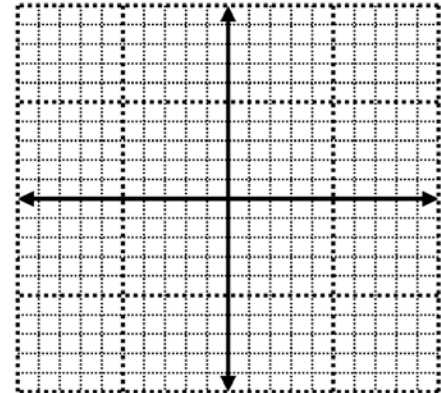
2. The graph of $f(x)$ has, at most, one horizontal asymptote.

Degree:	Horizontal Asymptote:
$N < D$	$y = 0$
$N = D$	$y = \frac{a}{b}$
$N > D$	none

Notes: Unit 1.5 - Graph Rational Functions Without Calculator

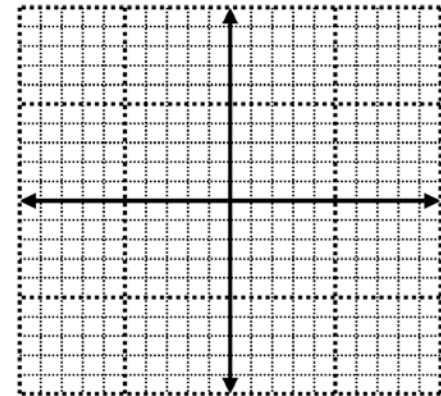
1. $\sqrt{7-3x}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



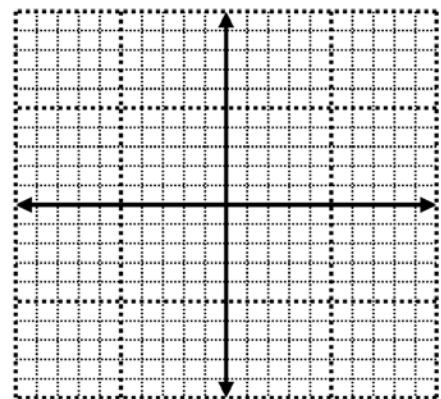
2. $\frac{x+3}{x^2-9}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



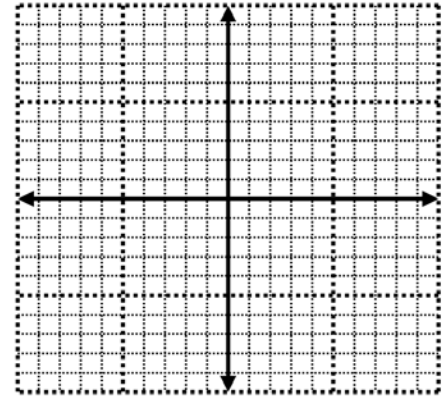
3. $\frac{x^2+5x}{x^2+3x-10}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



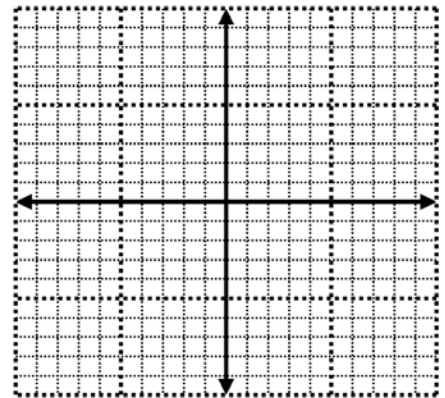
4. $\sqrt{x^2 - 6x}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



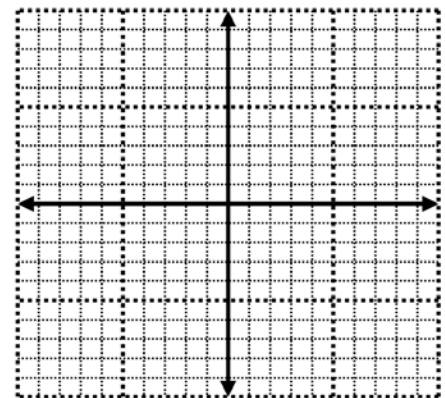
5. $\sqrt{\frac{x-3}{x+4}}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



6. $\frac{2}{\sqrt{x+1}}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)

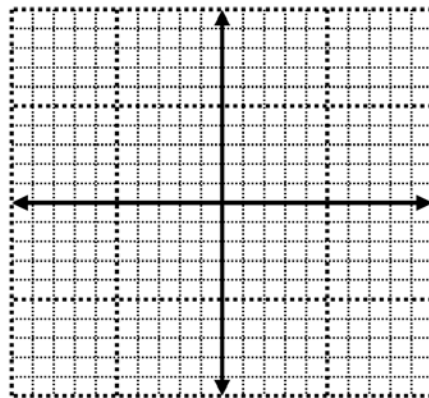


HW 5: Unit 1.5 – Graph Rational Functions Without Calculator

Identify the domain, range, x -intercept(s), y -intercept, $HASY$, and $VASY(s)$ of the following rational expressions. Use the characteristics to graph the function.

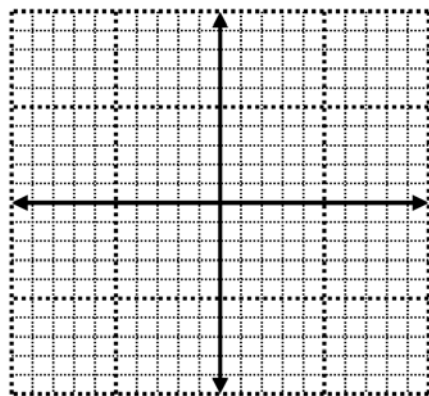
1. $f(x) = \sqrt{3 - x}$

- _____ domain
- _____ range
- _____ x -intercept(s)
- _____ y -intercepts
- _____ $HASY$
- _____ $VASY(s)$



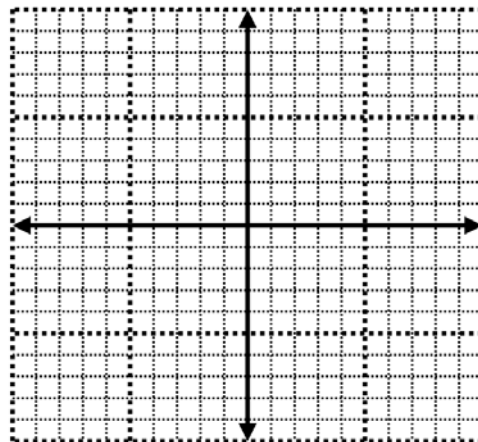
2. $f(x) = \sqrt{3x - 2}$

- _____ domain
- _____ range
- _____ x -intercept(s)
- _____ y -intercepts
- _____ $HASY$
- _____ $VASY(s)$



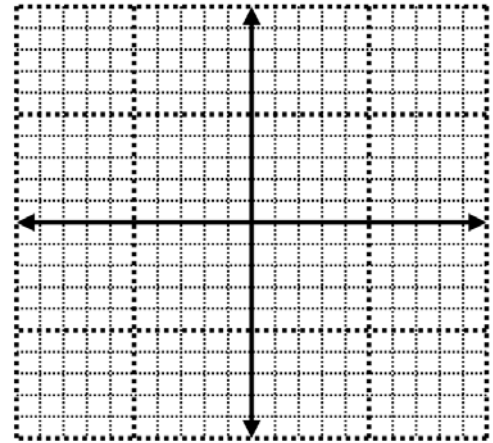
3. $g(x) = \sqrt{4 - x^2}$

- _____ domain
- _____ range
- _____ x -intercept(s)
- _____ y -intercepts
- _____ $HASY$
- _____ $VASY(s)$



4. $h(x) = \sqrt{\frac{x+3}{x^2-36}}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)



5. $h(x) = \sqrt{\frac{x-1}{x+2}}$

- _____ domain
- _____ range
- _____ x-intercept(s)
- _____ y-intercepts
- _____ *HASY*
- _____ *VASY*(s)

