

2-6 Rational Functions

Rational function $f(x) = \frac{ax^n + \dots}{bx^m + \dots}$

Vertical asymptotes — Zeros of denominator

Horizontal asymptotes
- if $n < m$, the x-axis is a H.A.

- if $n = m$, the line $y = \frac{a}{b}$ is a H.A.

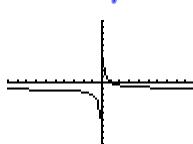
Holes — Factors cancel out

Ex 1 Find the asymptotes and graph.

$$f(x) = \frac{(1-x)}{(1x)} - \frac{x+1}{x}$$

V.A.: $x = 0$

H.A.: $y = -\frac{1}{1} = -1$



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Ex 2 Find the asymptotes and graph.

$$f(x) = \frac{(x^2 + 6x + 9)}{(x^2 + 4x + 3)}$$

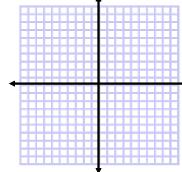
V.A.: $x = -1$

H.A.: $y = \frac{1}{1} = 1$

Hole: $x \neq -3$

Ex 3 Find the asymptotes and graph.

$$f(x) = \frac{x^2 + 7x + 12}{x^2 - 4}$$



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Homework

p.152
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