Unit: Rational Functions

Lesson 3.1: Analyze Rational Functions

$f(x) = \frac{g(x)}{h(x)}$

- Find all Point (Removable) Discontinuities
- Find all Intercepts
- Find all Asymptotes

Example 1

Analyze the rational function $f(x) = \frac{x^3 + 4x^2 - 25x - 100}{x^2 - 2x - 15}$ by determining the asymptotes, discontinuities and intercepts.

Simplified Function

Horizontal/Oblique Asymptotes

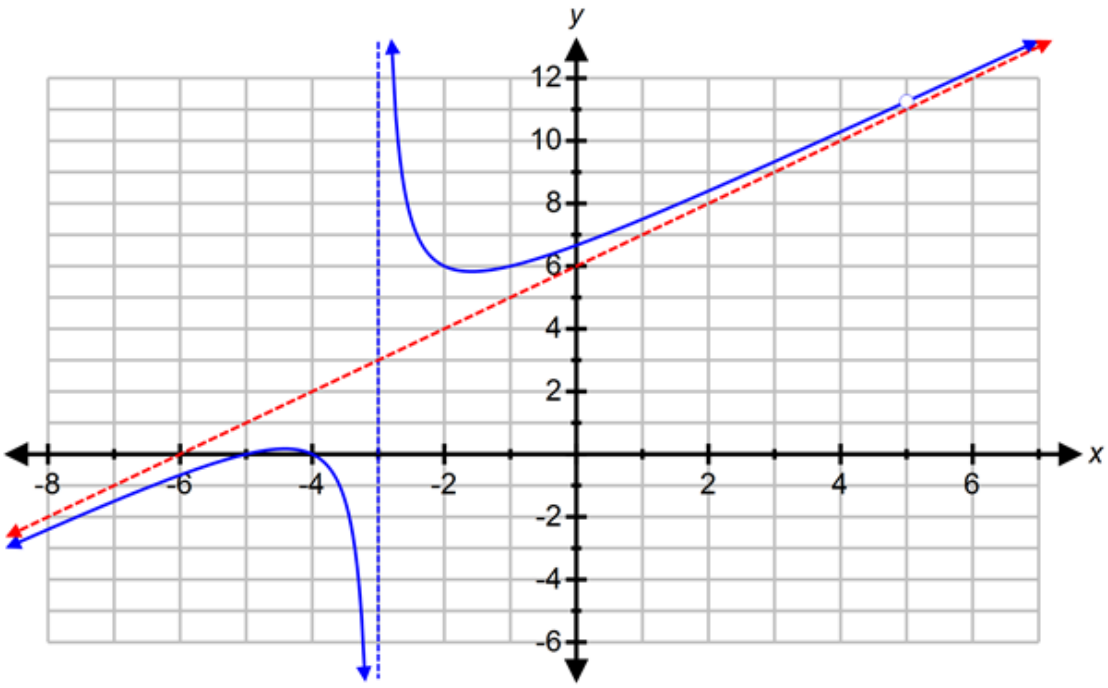
Vertical Asymptotes

Removable (Point) Discontinuities

x-intercept:

y-intercept:

$$f(x) = \frac{x^3 + 4x^2 - 25x - 100}{x^2 - 2x - 15}$$



Example 2

Provide a complete analysis of the function $f(x) = \dfrac{x^2 + 2}{x^2 + 3x + 2}$

Your Turn 1

Provide a complete analysis of the following functions:

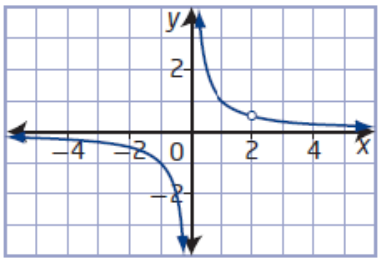
(a) $f(x)=\dfrac{x-2}{x^2-3x+2}$

(b) $f(x)=\dfrac{x^2-4}{2-x}$

Your Turn 2

Which graph matches the equation $f(x) = \dfrac{2x}{x^2 + 2x}$?

A



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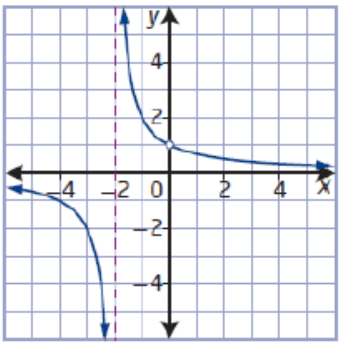

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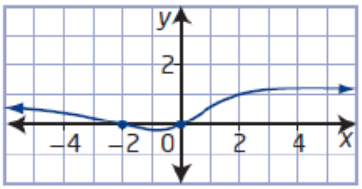

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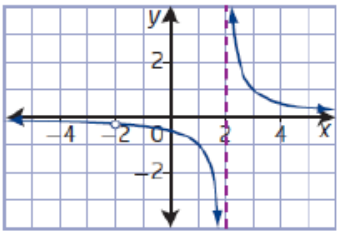

Your Turn 3

Provide a complete analysis for $y = \dfrac{x^3 - x^2 - 4x + 4}{2x^3 - 4x^2}$