Vocabulary used in Rational Functions

***x*-intercept or zeros**: where the graph crosses the x-axis, notation—$(x, 0)$

***y*-intercept**: where the graph crosses the y-axis, notation—$(0, y)$

Vertical Asymptote: a vertical line on the graph that the function approaches but never touches; it is appears as a dotted line on the graph, notation—$x =$ where the line crosses the x −axis, write a separate equation for each asymptote

Horizontal Asymptote: a horizontal line on the graph that the function approaches but never touches; it appears as a dotted line on the graph, notation—$y =$ where the line crosses the y −axis
                    ***ONLY FOR END BEHAVIOR

Domain: the set of all x-values, <u>do not include</u> the asymptotes

Range: the set of all y-values, <u>sometimes do not include</u> the asymptotes

Example: The domain, range, intercepts, and asymptotes have been found using the given graph.

x-intercept(s): $(4.5, 0)$

y-intercept: $(0, -2.25)$

Vertical Asymptote: $x = 4$

Horizontal Asymptote: $y = -2$

Domain: $(-\infty, 4) \cup (4, \infty)$

Range: $(-\infty, -2) \cup (-2, \infty)$

Vertical Asymptote
$x = 4$

x-intercept
$\left(\dfrac{9}{2}, 0 \right)$

y-intercept
$\left(0, \dfrac{-9}{4} \right)$

Horizontal Asypmtote
$y = -2$

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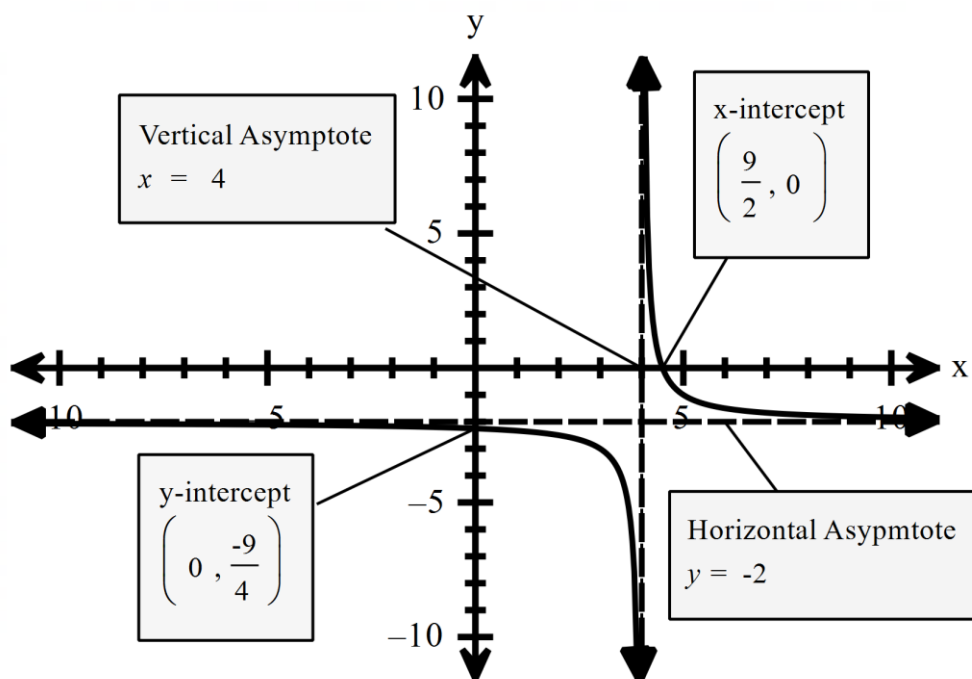
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