Algebra II Module4

Determine the asymptotes for the function $f(x) = \frac{2x-5}{x+3}$

$\frac{2}{1}$

V.A = $x+3$

$x = -3$

H.A. $y = 2$

Standard page

Answer

MAFS.912.F-IF.2.5
MAFS.912.F-IF.3.7
Problem 2

Relate the domain of a function to its graph and, where applicable, to the quantitative relationship if describes. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

Horizontal Asymptotes: Compare the highest exponent in the numerator with the highest exponent in the denominator.

the numerator > the denominator - no horizonal asymptote

the numerator < the denominator - horizontal asymptote at y = 0

the numerator = the denominator, write the coefficients of the highest degree as a fraction. This becomes the horizontal asymptote.

8-3 Practice

Rational Functions and Their Graphs

Find the domain, points of discontinuity, and x- and y-intercepts of each rational function. Determine whether the discontinuities are removable or nonremovable.

1. $y = \dfrac{(x-4)\cancel{(x+3)}}{\cancel{x+3}}$

$x+3=0$

$x=-3$

y-int

$y = \dfrac{(-4)(3)}{3}$

$y=-4$

Domain $x \neq -3$

y-int $= (0,-4)$

x-int $= (4,0)$

$0 = x-4$ removable

$4 = x$

3. $y = \dfrac{2}{x+1}$

nonremovable

Domain: $x \neq -1$

y-int: $(0, 2)$

x-int: none

$x + 1 = 0$

$x = -1$

y-int

$y = \dfrac{2}{0+1}$

$y = 2$

$(x+1)$

x-int

$0 = \dfrac{2}{\cancel{x+1}} \cancel{(x+1)}$

$0 = 2$

Find the vertical asymptotes and holes for the graph of each rational function.

5. $y = \dfrac{5-x}{x^2-1}$

$y = \dfrac{-x+5}{(x+1)(x-1)}$

$x^2 - 1 = 0$

$+1 \quad +1$

$\sqrt{x^2} = \sqrt{1}$

$x = \pm 1 \rightarrow$ V.A

7. $y = \dfrac{\cancel{x}}{\cancel{x}(x-1)}$

$x = 0$ $\quad$ $x - 1 = 0$

$\downarrow$ $\quad$ $x = 1$

hole $\quad$ $\downarrow$

V.A

7. $\cancel{y = \frac{x}{x(x-1)}}$

9. $y = \frac{x-2}{(x+2)(x-2)}$

$x = -2$ $x = 2$

$\downarrow$ $\downarrow$

V.A hole

11. $y = \frac{x^2 - 25}{x - 4}$ $\frac{(x+5)(x-5)}{x-4}$

$x - 4 = 0$

$x = 4$

$\downarrow$

V.A