Name: _Selected Answers_

Graphing Rational Functions

State any holes and asymptotes for the following functions

1. $f(x) = \dfrac{x+5}{x+1}$

2. $f(x) = \dfrac{(x+3)(x-1)}{(x-3)(x-1)}$ $x \neq 3, 1$

Holes: $x = 1$
V.A: $x = 3$
H.A.: $x = 1$

Sketch the graph of the given rational function and analyze.

7. $f(x) = \dfrac{x-1}{x+1}$

X – intercept: $(1, 0)$
Y – intercept: $(0, -1)$
V Asymptote: $x = -1$
H Asymptote: $y = 1$
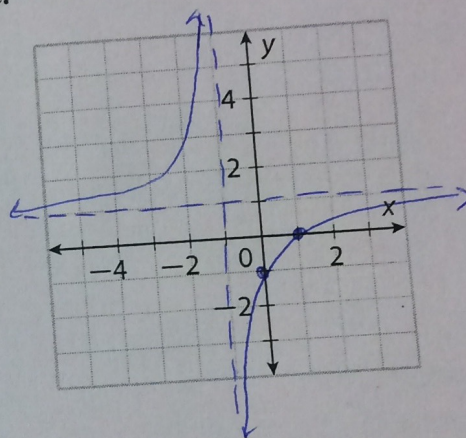Hole(s): None
Domain: $(-\infty, -1) \cup (-1, \infty)$
Range: $(-\infty, 1) \cup (1, \infty)$
End Behavior:

AS $x \to -\infty, \ y \to 1$
AS $x \to +\infty, \ y \to 1$

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

$\dfrac{0-1}{0+1} = \dfrac{-1}{1} = -1$

Asymptote Behavior:
AS $x \to -1^-, \ y \to +\infty$
AS $x \to -1^+, \ y \to -\infty$

8. $f(x) = \dfrac{x-1}{x-2}$

X – intercept: $(\quad , 0)$
Y – intercept: $(0, \quad)$
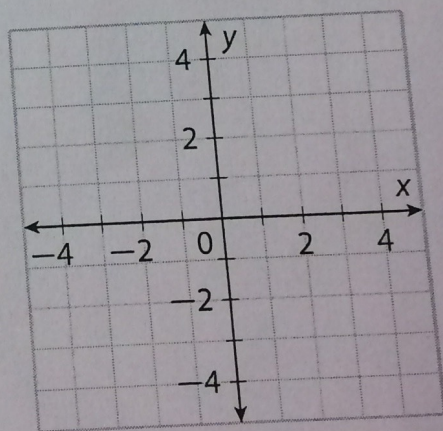V Asymptote: $x =$
H Asymptote: $y =$
Hole(s):
Domain:
Range:
End Behavior:

AS $x \to \qquad , y \to$
AS $x \to \qquad , y \to$

Asymptote Behavior:
AS $x \to \qquad , y \to$
AS $x \to \qquad , y \to$

Name: _____

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

X – intercept: $(2/3, 0)$

Y – intercept: $(0, 2/3)$

V Asymptote: $x = 3$

H Asymptote: $y = 3$

Hole(s): None

Domain: $(-\infty, 3) \cup (3, \infty)$
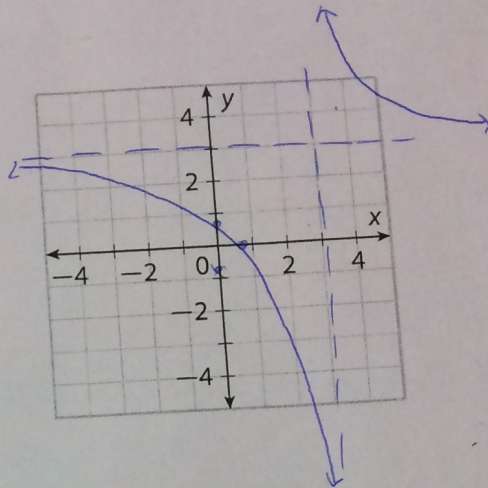
Range: $(-\infty, 3) \cup (3, \infty)$

End Behavior:

AS $x \to -\infty, \ y \to 3$

AS $x \to \infty, \ y \to 3$

$3x - 2 = 0$
$+2 \ +2$
$\dfrac{3x}{3} = \dfrac{2}{3}$ $x = 2/3$

$\dfrac{(3(0) - 2)}{0 - 3} = \dfrac{-2}{-3} = 2/3$

10. $f(x) = \dfrac{3x - 4}{x - 2}$

X – intercept:

Y – intercept:

V Asymptote:

H Asymptote:

Hole(s): None

Domain:

Range:

End Behavior: