

Identify any holes in the graph. Then find the x and y intercepts.

1. $y = \frac{3x-3}{x^2-1}$
 $\frac{3(x-1)}{(x+1)(x-1)}$

2. $f(x) = \frac{x^2+4x+3}{2x^2+5x-7}$
 $\frac{(x+3)(x+1)}{(2x+7)(x-1)}$

HOLE: $x=1, y=3/2$ $(1, 3/2)$ HOLE: none

X intercept: none
 Set $y=0$

x Intercept: set $y=0$ $(x+3)(x+1)=0$

Y intercept: $(0, 3)$
 Set $x=0$

y intercept: $\frac{3}{-7}$ $(0, -3/7)$
 Set $x=0$
 $x = -3$
 $x = -1$

Describe the vertical asymptotes and holes for the graph of each function.

3. $y = \frac{(x+3)(x-2)}{(x-2)(x+1)}$

4. $y = \frac{x^2-4}{x+2}$

5. $f(x) = \frac{6x^2+x-2}{3x^2+17x+10}$

$y = x-2$

$\frac{(3x+2)(2x-1)}{(3x+2)(x+5)}$

vert asym: $x = -1$

vert asym: none

vert asym: $x = -5$

holes: $(2, 5/3)$

holes: $-2, -4$

holes: $(-2/3, -7/13)$

Find the horizontal asymptote of the graph of each rational function.

6. $y = \frac{5}{x+6}$
 H.A.

7. $y = \frac{x+2}{2x^2-4}$

8. $y = \frac{x+1}{x+5}$

BOBO
 $y = 0$

$y = 0$

$y = 1$

$\frac{-4}{3} \cdot \frac{3}{8} = \frac{-7}{8}$
 $\frac{-7}{8} \cdot \frac{8}{13} = \frac{-7}{13}$

9. $y = \frac{x^2+2}{2x^2-1}$

10. $f(x) = \frac{5x^3+2x}{2x^5-4x^3}$

11. $g(x) = \frac{3x-4}{4x+1}$

$y = \frac{1}{2}$

BOBO
 $y = 0$

$y = \frac{3}{4}$

Analyze the function algebraically. Use the information you find to sketch the graph of the function.

12. $f(x) = \frac{5}{x+6}$

x-intercept: none

y-intercept: (0, 5/6)

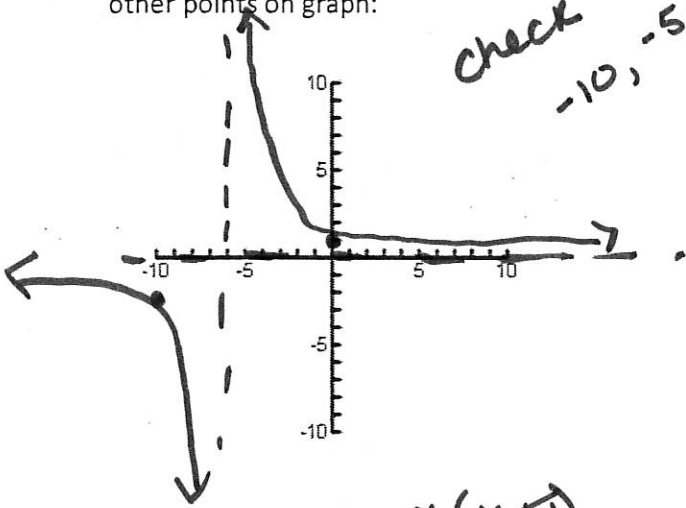
vertical asymptotes: x = -6

horizontal asymptotes: y = 0

holes: none

other points on graph:

*check x = 10
-10, -5/4*



13. $g(x) = \frac{x+3}{x^2-x-12} = \frac{1}{x-4}$

x-intercept: none

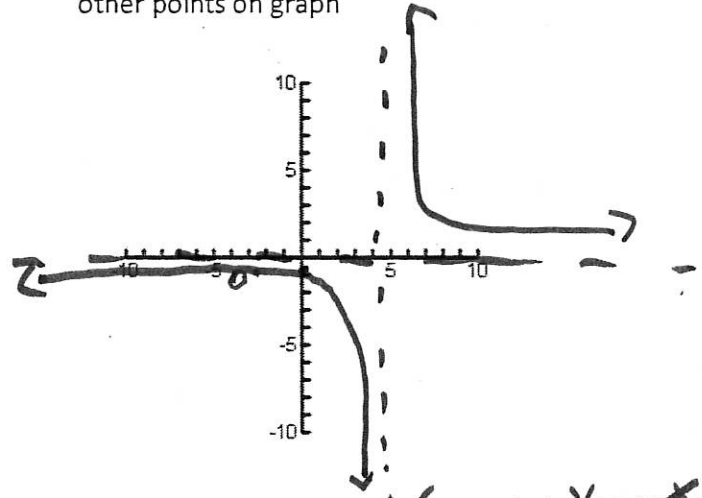
y-intercept: (0, -1/4)

vertical asymptotes: x = 4

horizontal asymptotes: y = 0

holes: (-3, -1/7)

other points on graph



14. $h(x) = \frac{x^2+1x}{x+1}$

$\frac{x(x+1)}{(x+1)}$

line w/ hole

x-intercept: (0, 0)

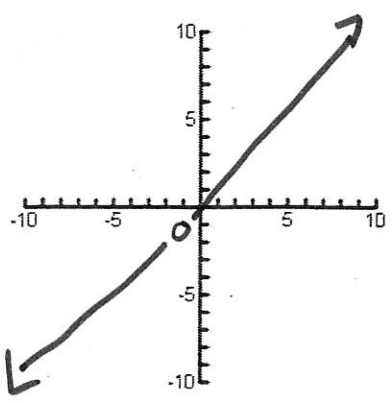
y-intercept: (0, 0)

vertical asymptotes: none

horizontal asymptotes: none

holes: (-1, -1)

other points on graph



15. $g(x) = \frac{2x^2-9x+4}{x^2-x-12}$

$\frac{(2x-1)(x+4)}{(x-4)(x+3)}$

x-intercept: (1/2, 0)

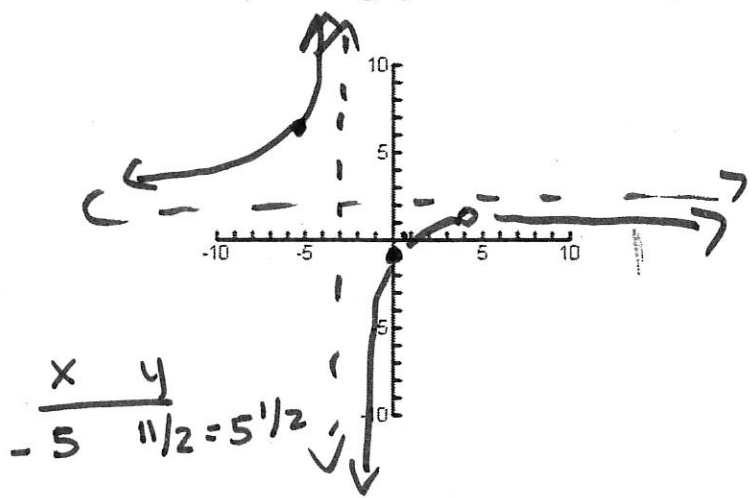
y-intercept: 0, -1/3

vertical asymptotes: x = -3

horizontal asymptotes: y = 2

holes: (4, 1)

other points on graph



$\frac{x}{y} = \frac{-5}{11/2} = 5\frac{1}{2}$