1) $f(x) = \frac{1}{3x^2+3x-18} = \frac{1}{3(x^2+x-6)} = \frac{1}{3(x+3)(x-2)}$

VA: $x=-3$, $x=2$ Holes: none HA: $y=0$

x-int: none

2) $f(x) = \frac{x-2}{x-4}$ VA: $x=4$ Holes: none HA: $y=1$

x-int: 2

3) $f(x) = \frac{x^3-x^2-6x}{-3x^2-3x+18} = \frac{x(x^2-x-6)}{-3(x^2+x+6)} = \frac{x(x-3)(x+2)}{-3(x^2+x+6)}$ ← doesn't factor

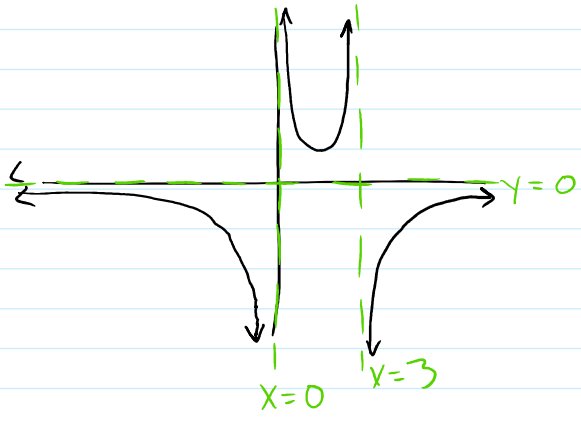
VA: none HA: none Holes: none x-int: 0, 3, -2

4) $f(x) = \frac{x^2+x-6}{-4x^2-16x-12} = \frac{(x-2)(x+3)}{-4(x^2+4x+3)} = \frac{(x-2)\cancel{(x+3)}}{-4\cancel{(x+3)}(x+1)} = \frac{x-2}{4(x+1)}$

VA: $x=-1$ HA: $y=-1/4$ Hole: $x=-3$ x-int: 2

5) $f(x) = -\frac{4}{x^2-3x} = \frac{-4}{x(x-3)}$ VA: $x=0$, $x=3$ HA: $y=0$

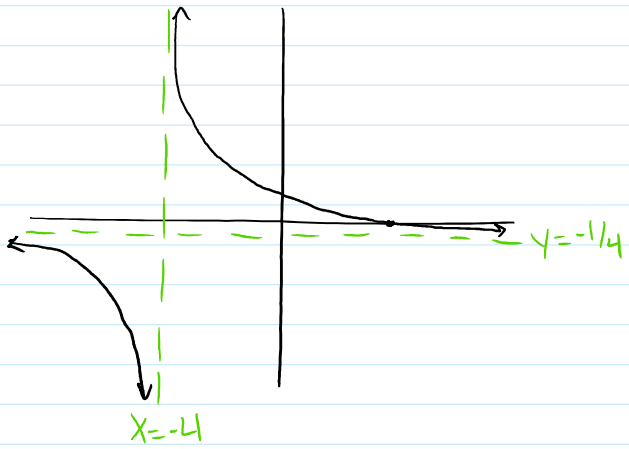
x-int: none Hole: none



6) $f(x) = \frac{x-4}{\quad} - \frac{x-4}{\quad}$ VA: $x=-4$ HA: $y=-1/4$ Hole: none

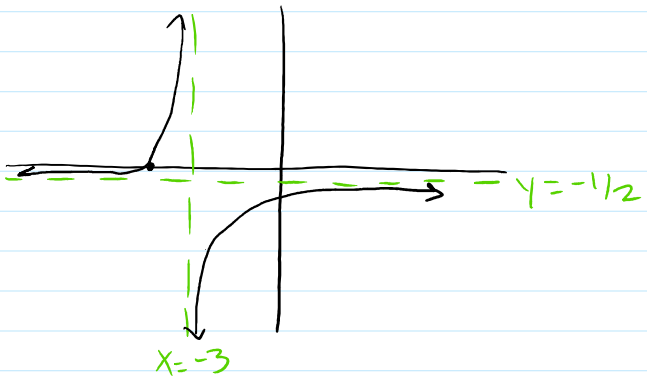
6) $f(x) = \frac{x-4}{-4x-16} = \frac{x-4}{-4(x+4)}$

VA: $x=-4$ HA: $y=-1/4$ Hole: none
x-int: 4



7) $f(x) = \frac{x+4}{-2x-6} = \frac{x+4}{-2(x+3)}$

VA: $x=-3$ HA: $-1/2$ Hole: none
x-int: -4



8) $f(x) = \frac{x^3-9x}{3x^2-6x-9} = \frac{x(x^2-9)}{3(x^2-2x-3)} = \frac{x(x-3)(x+3)}{3(x-3)(x+1)} = \frac{x(x+3)}{3(x+1)}$

VA: $x=-1$ HA: none Hole: $x=3$ x-int: $x=-3, 0$