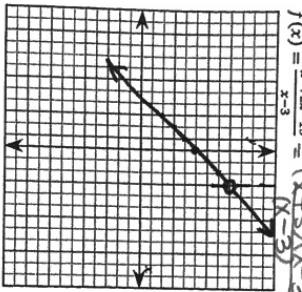
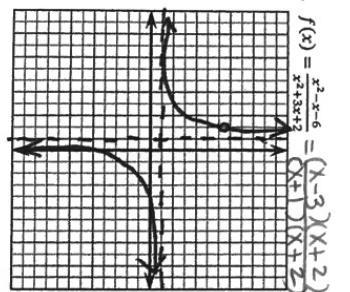


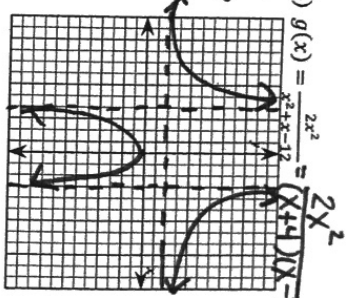
A. $x \neq 3$
 B. hole $x=3$
 $y=x+5$
 with hole
 at $x=3$



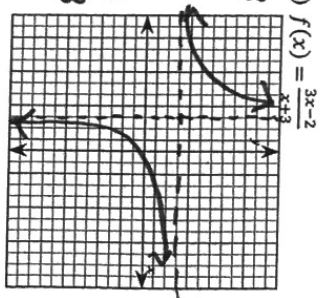
A. $x \neq -1, -2$
 B. VA $x=-1$
 hole $x=-2$
 HA $y=1$



A. $x \neq 3, -4$
 B. no holes
 no SA
 HA $y=2$
 VA $x=3$
 $x=-4$



A. $x \neq -3$
 B. no holes
 no SA
 HA $y=3$
 VA $x=-3$

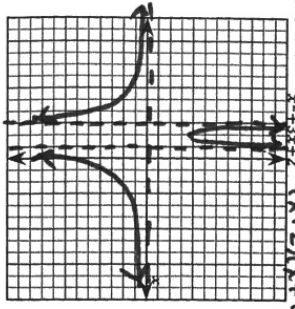


6.4 More Graphing Rationals

For each function below:

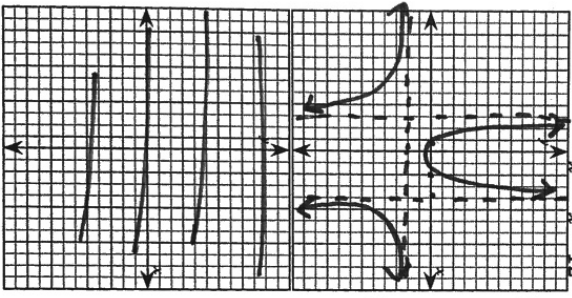
- Find the values of x which must be excluded from the domain.
- Find any holes, vertical, horizontal, and/or slant asymptotes.
- Use intercepts, asymptotes, and other points to sketch the graphs.

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



A. $x \neq -2, -1$
 B. no holes
 no SA
 VA $x=-2, x=-1$
 HA $y=0$

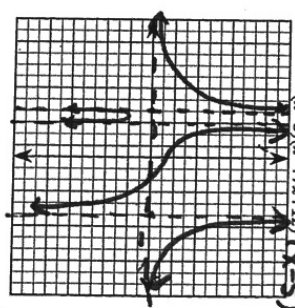
2) $h(x) = \frac{-2x^2+3x+2}{x^2-x-12} = \frac{-(2x^2-3x-2)}{(x-4)(x+3)}$



A. $x \neq 4, -3$
 B. no holes
 no SA
 HA $y=-2$
 VA $x=4$
 $x=-3$
 no holes

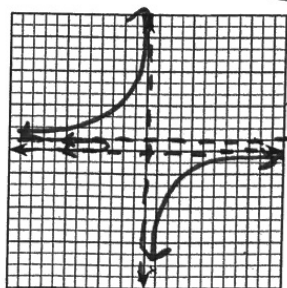
A. $x \neq 5, -3, -4$
 B. HA $y=0$ VA $x=5$ $x=-3$ $x=-4$

5) $p(x) = \frac{(x+8)(x-3)}{(x-5)(x^2+7x+12)} = \frac{(x+8)(x-3)}{(x-5)(x+3)(x+4)}$



A. $x \neq 0, -1$
 B. HA $y=0$
 VA $x=0$ $x=-1$

7) $g(x) = \frac{1}{x(x+1)^2}$



- 8) Write the equation of the rational function having these characteristics.
- vertical asymptotes at $x=4$ and $x=-1$
 - x intercepts at $(3, 0), (-2, 0)$
 - horizontal asymptote at $y=2/3$
 - y intercept at $(0, 1)$

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

9) Divide using long division: $(3x^3+4x-1)/(x^2+1)$

$$\begin{array}{r} 3x \\ 3x^3 + 0x^2 + 4x - 1 \\ \underline{-(3x^3 + 0x^2 + 3x)} \\ x - 1 \end{array}$$

3x: remainder

$$\frac{x-1}{x^2+1}$$