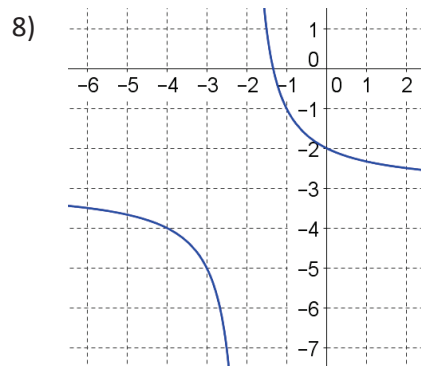
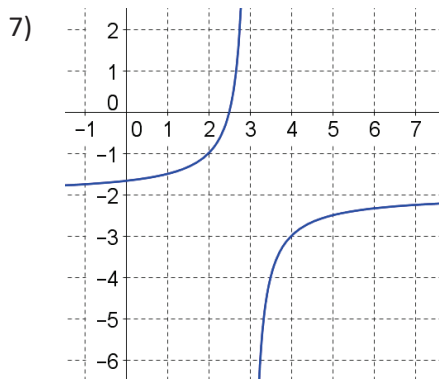
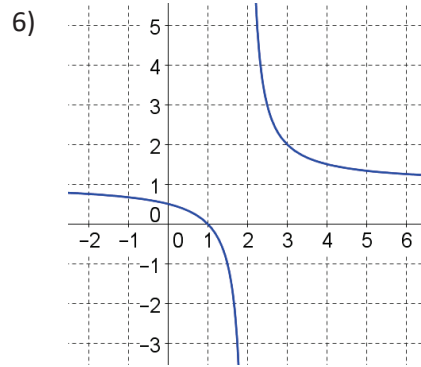
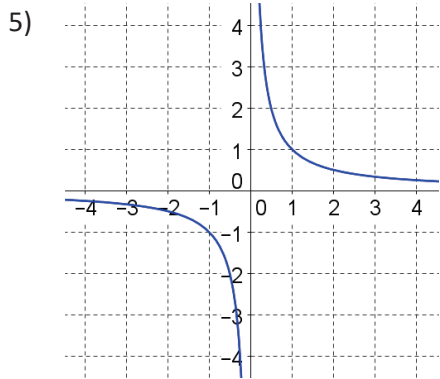


### HW5.1

For each function, state the x-values of the vertical asymptotes (VA), holes (H), and end behaviors (EB):

- |                             |                                      |                                 |                                  |
|-----------------------------|--------------------------------------|---------------------------------|----------------------------------|
| 1) $f(x) = \frac{x-2}{x+3}$ | 2) $f(x) = \frac{(x-1)}{(x+5)(x-1)}$ | 3) $f(x) = \frac{(x+2)^2}{x+2}$ | 4) $f(x) = \frac{1}{(x-6)(x+7)}$ |
| VA:                         | VA:                                  | VA:                             | VA:                              |
| H:                          | H:                                   | H:                              | H:                               |
| EB:                         | EB:                                  | EB:                             | EB:                              |

Problems: Describe the asymptotic and end behavior(s) using limit notation.



Simplify the functions (be sure to include stipulations); state the x-values of the vertical asymptotes (VA), holes (H), and end behaviors (EB):

$$9) f(x) = \frac{x^2 + 2x + 1}{x^2 + 4x + 3}$$

$$10) f(x) = \frac{2x^2 - 5x - 12}{x^3 - 16x}$$

$$11) f(x) = \frac{12x^2 - 5x - 2}{9x^2 - 12x + 4}$$