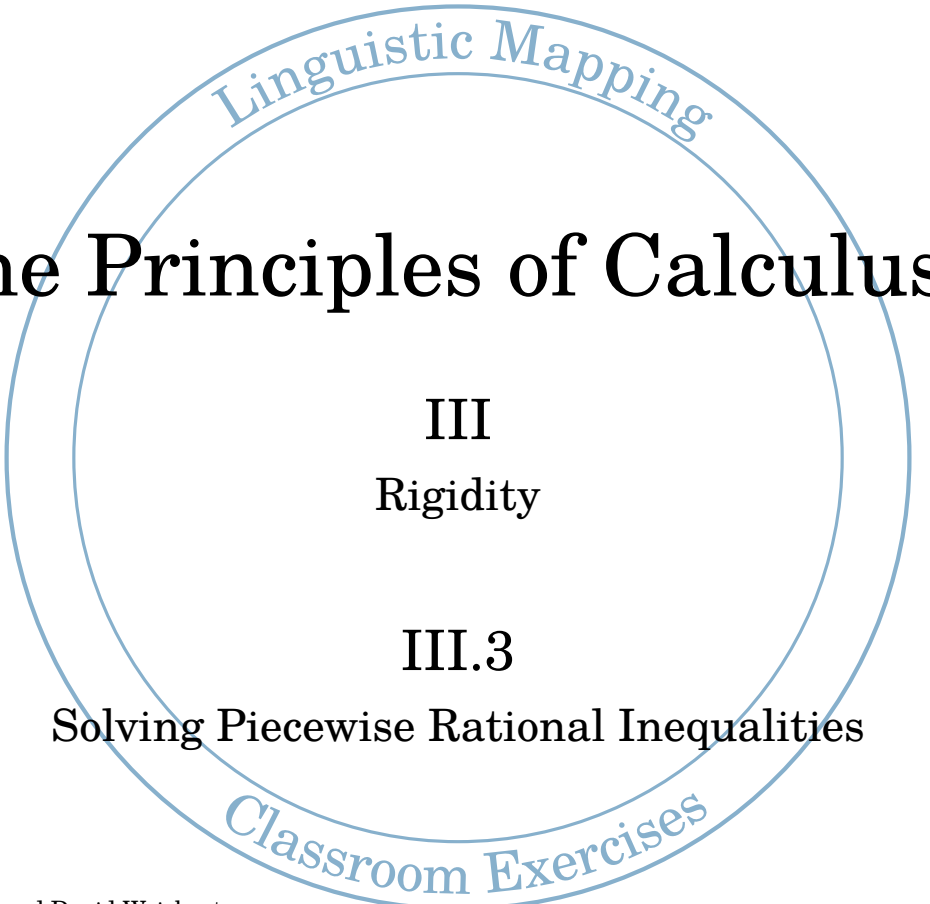


The Principles of Calculus I

III

Rigidity

III.3

Solving Piecewise Rational Inequalities

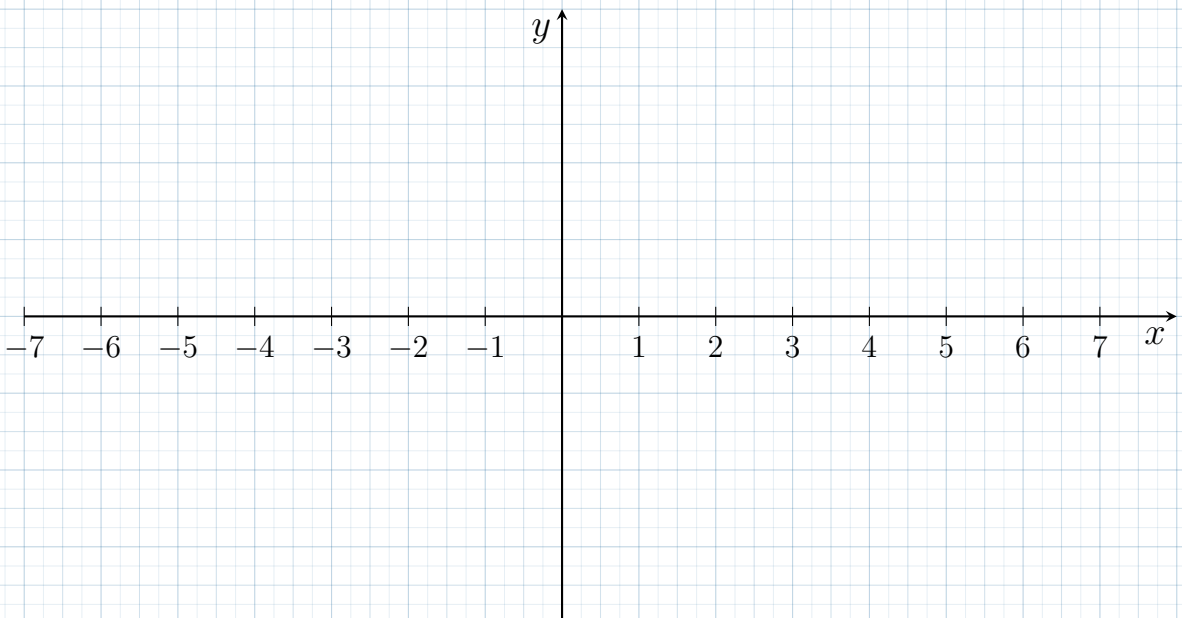
Exercise 1

Take f to be the polynomial function given by

$$f(x) = (x+3)^3(x-1)^2(x-5).$$

Identify the local and asymptotic behavior of f, and use this behavior to produce a graphical representation of f in order to determine all solutions to these inequalities:

(a) $f(x) > 0$; (b) $f(x) \geq 0$.



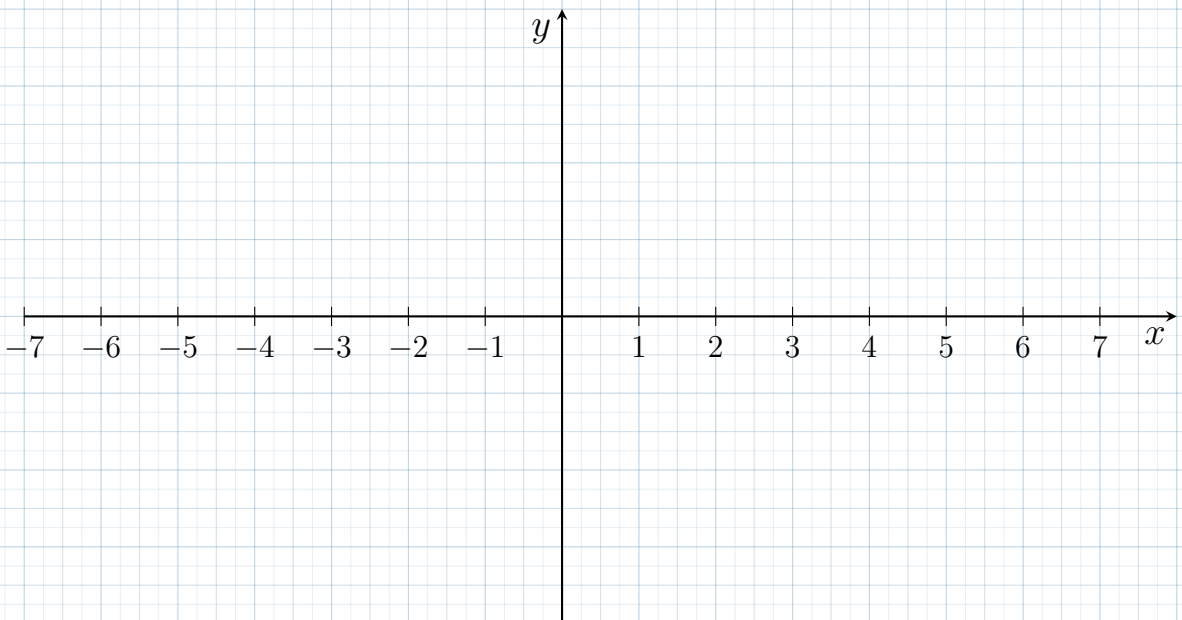
Exercise 2

Take f to be the rational function given by

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

Use a graphical representation of f to determine all solutions to these inequalities:

(a) $f(x) < 0$; (b) $f(x) \leq 0$.



Exercise 3

Take f to be the rational function that is sketched below and write $|f|$ as a piecewise function.