3.8: Polynomial and Rational Inequalities

Supplementary Notes

$$\frac{g(x)}{h(x)} > 0 \quad \text{or} \quad \frac{g(x)}{h(x)} \geq 0 \quad \text{or} \quad \frac{g(x)}{h(x)} < 0 \quad \text{or} \quad \frac{g(x)}{h(x)} \leq 0$$

where g and h are polynomial functions.

The sign of a function can be determined by the sign of its factors. The sign may change at a *zero* or *vertical asymptote* of the function.

Exercises

1. Solve $x^2 + x \leq 20$
2. Solve $\frac{x(x^2+1)(x-2)}{(x-1)(x+1)} > 0$

Below are the graphs of

$$f(x) = x^2 + x + 20 \qquad \text{and} \qquad g(x) = \frac{x(x^2+1)(x-2)}{(x-1)(x+1)}$$