

3.6 Rational Functions

1. Add the two given rational functions to get a rational function over a common denominator.

(a) $R(x) = \frac{x-4}{x+3}$ and $S(x) = \frac{2x+1}{x-5}$

(b) $R(x) = \frac{3x-1}{2x+2}$ and $S(x) = \frac{x-4}{3x+2}$

(c) $R(x) = \frac{x^2-1}{x+5}$ and $S(x) = \frac{3x^3+2}{x+1}$

(d) $R(x) = \frac{x^2-x+1}{3x-4}$ and $S(x) = \frac{x+3}{x^2+2}$

(e) $R(x) = \frac{x^3-2x}{x+4}$ and $S(x) = \frac{x^4-2}{3x+1}$

2. For the given rational function,

i) Find the zeros.

ii) Find the vertical asymptotes.

iii) Find the horizontal or oblique asymptotes.

iv) Make a sign chart.

v) Sketch the graph.

(a) $y = \frac{x-3}{x^2-1}$

(b) $y = \frac{x+5}{x-2}$

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

(d) $y = \frac{x^2-6x-7}{x-2}$

(e) $y = \frac{x^2+x-6}{x+1}$

3. Solve the rational inequality.

(a) $\frac{x-3}{x+1} > 0$

(b) $\frac{x+2}{x-3} \leq 0$

(c) $\frac{1}{x+3} > 0$