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### Rational Functions (2)

1. Solve each of the following equations.

a.  $\frac{x^2-5x-6}{2x^2-x-3} = 0$

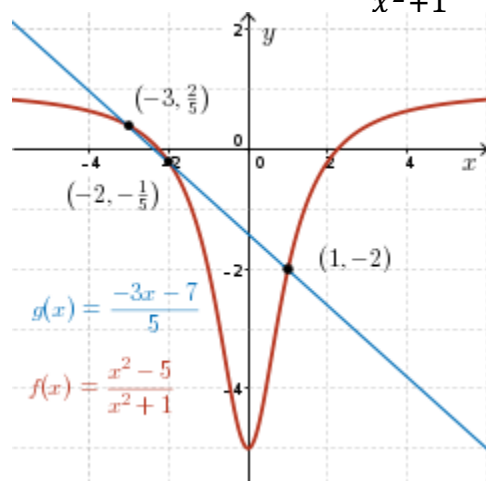
b.  $\frac{x}{x-2} + \frac{1}{1-x} = \frac{x}{x^2-3x+2}$

c.  $\frac{2x^2-x}{3} - 4 = \frac{3}{x}$

d.  $\frac{x+3}{1-\frac{3}{1-\frac{1}{x+3}}} = -\frac{x}{2}$

2. Given a rational function  $f(x) = \frac{x^2-x-12}{2x^2+9x+4}$ , determine all asymptotes of the function. Show, algebraically, that the graph of the function will cross the horizontal asymptote.

3. Given the graphs of  $f(x) = \frac{x^2-5}{x^2+1}$  and  $g(x) = \frac{-3x-7}{5}$ , determine the solution of  $\frac{x^2-5}{x^2+1} < \frac{-3x-7}{5}$



4. Solve each inequality algebraically. State the solution using interval notation, where  $x \in \mathbb{R}$ .

a.  $\frac{3x+4}{2x-1} > 0$

b.  $\frac{3-x}{2x+2} > \frac{x}{2}$

c.  $\frac{3}{x-2} - \frac{x-3}{x+1} > \frac{x}{x-2}$

d.  $\left| \frac{x+4}{x-3} \right| \leq 3$

**5. a.** If  $T = x^2 + \frac{1}{x^2}$ , determine the values of  $b$  and  $c$  so that  $x^6 + \frac{1}{x^6} = T^3 + bT + c$  for all non-zero real numbers  $x$ .

**b.** If  $x$  is a real number satisfying  $x^3 + 1/x^3 = 2\sqrt{5}$ , determine the exact value of  $x^2 + 1/x^2$ .