Problem 1

a) (6 pts) Find the domain, range, horizontal and vertical asymptotes of \( f(x) = \frac{2x+1}{3x-4} \).

b) (4 pts) Solve the inequality \( f(x) \geq 0 \) where \( f(x) \) is still \( \frac{2x+1}{3x-4} \).
Problem 2

a) (4 pts) If \( f(x) \) has horizontal asymptote \( y = 10 \), find a horizontal asymptote for \( f(2x) \) and \( 2f(x) \). Justify your solution.

b) (6 pts) If \( f(x) \) has a vertical asymptote \( x = 8 \), find a vertical asymptote for \( 2f(2x + 3) + 9 \). Explain how you get your answer.
Problem 3 (10 pts) Find a sequence of transformations that transforms the graph of \( f(x) = \frac{1}{x} \) to the graph of \( g(x) = \frac{2x}{x+2} \) step by step. Each transform in the sequence must be a horizontal or vertical shift, stretch, compress, or reflection.
Problem 4 \( f(x) = \frac{(x+4)(x-2)(x+3)}{(x-9)(x-6)} \)

a) (3 pts) Find the \( x \)-intercepts of \( f(x) \)

b) (3 pts) Solve the inequality \( f(x) > 0. \)

c) (4 pts) Solve the inequality \( f(x) \leq 0. \)