

Name: \_\_\_\_\_ Date: \_\_\_\_\_

**Problem 1** (8 points). Consider the function

$$g(x) = \frac{x^2 - 8x + 15}{3x^2 + 9x + 6}.$$

- (a) (2 point) Factor the expression completely.
- (b) (1 point) Find the  $x$ -intercepts of  $g$ .
- (c) (1 point) Find the  $y$ -intercepts of  $g$ .
- (d) (1 point) Find the vertical asymptotes of  $g$ , if they exist.
- (e) (1 point) Find the horizontal asymptotes of  $g$ , if they exist.
- (f) (2 point) Sketch the graph of  $g$ .

**Problem 2** (1 point). Graph  $f_0(x) = \sqrt{x}$ .

**Problem 3** (1 point). Graph  $f_1(x) = -\sqrt{x}$ .

**Problem 4** (1 point). Graph  $f_2(x) = -\sqrt{2x}$ .

**Problem 5** (1 point). Graph  $f_3(x) = -\sqrt{2x+3}$ .

**Problem 6** (1 point). Graph  $f_4(x) = -\sqrt{2x+3} + 5$ .

**Problem 7** (1 point). Find the domain and range of  $f_4(x) = -\sqrt{2x+3} + 5$ .