

**Math 141 Exam 3 (Sample)**

Name:

1. Let  $R(x) = \frac{x^2 + x - 2}{x^2 + x - 12} = \frac{(x-1)(x+2)}{(x+4)(x-3)}$ . Answer the following.

- (a) Find the domain.
- (b) Write  $R(x)$  in lowest terms.
- (c) Find the intercept(s) of the graph.
- (d) Find the vertical asymptote(s).
- (e) Find the horizontal or oblique asymptote, if one exist.
- (f) Sketch the graph.



5. (a) The following is the graph of a function  $y = f(x)$ .

(See Figure in Problem 46 on Page 267)

Draw the graph of  $y = f^{-1}(x)$

(b) Find the inverse of  $y = g(x) = \frac{1}{x+1}$ .

6. Use transformations to sketch the graph of  $f(x) = 3^{x-2} + 1$ . Determine the domain, range, and horizontal asymptote.

7. Let  $f(x) = \log_2(x-1)$ .

(a) Find the domain.

(b) Graph  $f$ .

(c) From the graph, determine the range and vertical asymptote of  $f$ .

(d) Find the inverse  $f^{-1}$  of  $f$ .

(e) Find the domain and the range of  $f^{-1}$ .

(f) Graph  $f^{-1}$ .

8. (a) Solve the equation  $27^{2x+1} = 9^{x-1}$ .

(b) Solve the equation  $\log_3(3x-2) = 4$ .