

College Algebra - Math 1050

Sample Exam II - 4 pages

Sections 3.3-5.4

Time Limit: 50 Minutes

NAME: \_\_\_\_\_

The point value of each problem is in the left-hand margin. You must show your work to receive any credit for your answers, except on problems 1&2. Work neatly.

(6) 1. True or False.

(        ) (a) If the remainder of the division of the polynomial  $f(x)$  by  $x - 2$  is 3, then  $f(2) = 3$

(        ) (b) Every  $3 \times 3$  linear system of equations has exactly one solution.

(        ) (d) The inverse of the function  $f(x) = \log_3 x$  is  $g(x) = x^3$ .

(6) 2. Fill in the blanks.

(a) The vertical asymptote(s) of the graph of the rational function  $f(x) = \frac{x}{x(x-2)}$  is (are) \_\_\_\_\_ .

(b) The **exact** value of  $\log_4 8$  is \_\_\_\_\_ .

(c) If  $2 - 3i$  is a zero of the polynomial  $P(x)$ , with real coefficients, then \_\_\_\_\_ is another zero of it.

(10) 3. Draw the graph of  $f(x) = 1 + \log_2(x - 1)$  by plotting points or first plotting an appropriate function and using transformations. In either case, you must find at least 4 points on this graph.

(10) 4. Given  $\log_b 2 = 0.61$ ,  $\log_b 3 = 0.96$  and  $\log_b 5 = 1.41$ . Find the *exact* value of  $\log_b \frac{45}{8}$ . Note: Do not attempt to find  $b$ .

(12) 5. Solve  $\log_2 x + \log_2 (x - 1) = 1$ .

(12) 6. Use the Intermediate Value Theorem to show that the function  $f(x) = x^3 + x + 4$  has a zero between  $-1.5$  and  $-1$  and approximate this zero to the nearest tenth.

- (12) 7. The amount  $Q(t)$  of a radioactive substance (in grams) remaining  $t$  years from now will be  $Q(t) = (42)2^{-0.017t}$ . After how many years will the amount remaining be 0.42 grams?

- (12) 8. Solve the following  $3 \times 3$  linear system of equations 
$$\begin{cases} 10x + 5y - 7z = 1 \\ -5x + y + 4z = 3 \\ 3x + 2y - 2z = -2 \end{cases}$$

(10) 9. Solve the  $2 \times 2$  nonlinear system  $\begin{cases} 2x^2 - y^2 = 2 \\ -3x + y = -5 \end{cases}$ .

(14) 10. Find all zeros of the polynomial  $f(x) = 2x^4 - 5x^3 - x^2 - 5x - 3$ .