

Practice Test 2

Tuesday, April 1, 2008

Mathematics for Business

22M:013:SCA TTh 6:00 - 8:00 PM

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Name:

You may take this home. Give yourself 60 minutes to complete your work. I'll give answers next class!

1. (Also see 5-24 as well as 31-42 pp. 89-90)

$$f(x) = x^2 + 1, g(x) = \sqrt{x}$$

(a) Find the domain of f .

(b) Find the domain of g .

(c) Find $f \circ g$ and the domain of $f \circ g$.

(d) Find $g \circ f$ and the domain of $g \circ f$.

2. (See also 13-23 and 39-54 pp. 99-100)
Show that f and g are inverse functions algebraically.

(a)

$$f(x) = 1 - x^3, \quad g(x) = \sqrt[3]{1 - x}$$

(b)

$$f(x) = \frac{x + 2}{x - 1}, \quad g(x) = \frac{x + 2}{x - 1}$$

3. (See also 9-12 p. 134, as well as 43-52 p. 135)
Sketch the graph of the quadratic function without using a graph utility. Identify the vertex, axis of symmetry, and x-intercept(s)

$$f(x) = 2x^2 - x + 1$$

4. (Also be able to do 5-18 and 45-48 as well as 49-56 pp. 159-160)
Use synthetic division to show that x is a solution of the third-degree polynomial equation, and use the result to factor the polynomial completely. List all of the solutions of the equation.

(a) $x^3 - 7x + 6 = 0$, $x = 2$.

(b) $2x^3 - 15x^2 + 27x - 10 = 0$, $x = 1/2$.

5. (See also 17-26, 27-36, 37-44, 45-54, 55-58 p. 167) Perform the operation and write the result in standard form.

(a) $(5 + 7i)(3 - 2i)$

(b) $\frac{2 + i}{2 - 5i}$

(c) $\frac{2}{1 + i} + \frac{3}{1 - i}$

6. (See also 37-42 and 55-72 p. 180) Find all the zeros of the polynomial function and write the polynomial as a product of linear factors.

(a) $f(x) = x^4 - 81$

(b) $h(x) = x^3 + 9x^2 + 27x + 35$

7. (See 47-54 p. 180) Use the given zero to find all the zeros of the function.

$g(x) = 4x^3 + 23x^2 + 34x - 10,$ with zero = $-3 + i$

8. (See 27-46 or 51-64 p. 194) Let

$$h(x) = \frac{x^2 - 5x + 4}{x^2 - 4}$$

(a) State the domain of h .

(b) Identify all the x -intercepts and y -intercepts.

(c) Find any vertical and horizontal asymptotes.

(d) Use additional test points as needed to graph the rational function.

9. (See 9-26 p. 204) Solve the inequality and graph the solution on the real number line.

$$4x^3 - 6x^2 < 0.$$

10. (See 37-50 p. 204. If you can graph the solution on the real line then you should be able to write the solution in interval notation) Solve the inequality and write your solution in interval notation.

$$\frac{2}{x+1} \leq \frac{3}{x-1}$$