FINAL EXAM

Mathematics 1320/1420, Spring 2014

Group A

Name:

Follow the instructions given to you by your instructor. The test consists of 20 multiple choice problems and 4 problems to be worked out completely.

1. Solve the equation.
$$2[2x - (3x - 2)] - 8(x - 2) = 0$$
   a) $\left\{\frac{6}{5}\right\}$
   b) {2}
   c) {-2}
   d) $\left\{-\frac{6}{5}\right\}$

2. Solve for the variable x in the equation shown below.
$$\frac{6}{x+4} - \frac{9}{x-4} = \frac{12}{x^2 - 16}$$
   a) {24}
   b) {72}
   c) {-24}
   d) $\{\sqrt{58}\}$

3. Perform the indicated operations and write the result in standard form.
$$(6 + 7i)(4 - i) - (2 - i)(2 + i)$$
   a) $28 + 22i$
   b) $26 + 34i$
   c) $26 + 22i$
   d) $36 + 22i$

4. Solve the equation by the method of your choice.
$$x^2 + 7x - 18 = 0$$
   a) {-9,1}
   b) {-2,9}
   c) {9,2}
   d) {-9,2}

5. Solve the polynomial equation by factoring and then using the zero product principle.
$$x^3 + 7x^2 - x - 7 = 0$$

   a) $\{49\}$
   b) $\{-7,1,7\}$
   c) $\{-7,-1,1\}$
   d) $\{-7,7\}$

6. Solve the absolute value equation or indicate that the equation has no solution.
$$|2x + 4| + 7 = 9$$

   a) $\{-3,-1\}$
   b) $\left\{-\frac{3}{2}, -\frac{1}{2}\right\}$
   c) $\emptyset$
   d) $\{1,3\}$

7. Solve the linear inequality and express the solution set in interval notation.
$$-35x - 30 \leq -5(6x + 4)$$

   a) $(-\infty, -2)$
   b) $[-2, \infty)$
   c) $(-2, \infty)$
   d) $(-\infty, -2]$

8. Write an equation of the line which is passing through (2,-3) and parallel to the line whose equation is $y = -2x + 3$. Write the equation in point-slope form.
   a) $y - 3 = -2(x - 2)$
   b) $y - 2 = -2(x + 3)$
   c) $y + 3 = -2(x - 2)$
   d) $y + 3 = x - 2$

9. Find the average rate of change of the function from x_1 to x_2.
   $f(x) = -3x^2 - x$ from $x_1 = 5$ to $x_2 = 6$
   a) $-\frac{1}{6}$
   b) -34
   c) -2
   d) $\frac{1}{2}$

10. Find the domain of the function.
$$f(x) = \sqrt{12 - x}$$

   a) $(-\infty, 12]$
   b) $(-\infty, 24) \cup (24, \infty)$
   c) $(-\infty, 12) \cup (12, \infty)$
   d) $(-\infty, 24]$

11. Given function f and g, find f-g.
$$f(x) = 6x - 9, \quad g(x) = 3x - 6$$

a) $9x - 15$
b) $3x - 15$
c) $3x - 3$
d) $-3x + 3$

12. Find the y-intercept of the polynomial function.
$$f(x) = -x^2 - 2x + 8$$

a) -1
b) 0
c) -8
d) 8

13. Determine if the graph of the polynomial has y-axis symmetry, origin symmetry, or neither.
$$f(x) = x^3 - 3x$$

a) origin symmetry
b) y-axis symmetry
c) neither

14. Use synthetic division to show that the number given to the right of the equation is a solution of the equation, and then solve the polynomial equation.
$$x^3 + 3x^2 - 10x - 24 = 0; \quad -2$$

a) {-4,-3,-2}
b) {-2,3,4}
c) {-4,-2,3}
d) {-3,-2,4}

15. Evaluate the expression without using a calculator.
$$e^{ln2x^3}$$

a) $2x^3$
b) e^{2x^3}
c) $ln2x^3$
d) 3

16. Use properties of logarithms to condense the logarithmic expression. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expression.
$$8 \ln(x-4) - 5\ln x$$

a) $\ln 40x(x-4)$
b) $\ln x^5(x-4)^8$
c) $\ln \frac{8(x-4)}{5x}$
d) $\ln \frac{(x-4)^8}{x^5}$

17. Solve the logarithmic equation.
$$\log_8(x^2 - 7x) = 1$$

a) {-1,8}
b) {1}
c) {8}
d) {-8,1}

18. Solve the system by method of your choice.
$$\begin{cases} x - 2y = 8 \\ -2x - 3y = 26 \end{cases}$$

a) {(4,-5)}
b) {(-5,-5)}
c) {(-4,-6)}
d) ∅

19. Give the order of the matrix, and identify the given element of the matrix.
$$\begin{bmatrix} 7 & 10 & -4 & -12 & -5 \\ 13 & -9 & 12 & -12 & 4 \\ -3 & 6 & 1 & 12 & 5 \\ 1 & 8 & 7 & 0 & 7 \end{bmatrix}; \quad a_{34}$$

a) 4 x 4; 1
b) 4 x 5; 12
c) 5 x 4; 7
d) 20; 5

20. Let $A = \begin{bmatrix} 1 \\ -3 \\ 2 \end{bmatrix}$ and $B = \begin{bmatrix} -1 \\ 3 \\ -2 \end{bmatrix}$. Find A-4B.

a) $\begin{bmatrix} -5 \\ 15 \\ -10 \end{bmatrix}$

b) $\begin{bmatrix} 5 \\ -6 \\ 4 \end{bmatrix}$

c) $\begin{bmatrix} -3 \\ 9 \\ -6 \end{bmatrix}$

d) $\begin{bmatrix} 5 \\ -15 \\ 10 \end{bmatrix}$

21. You inherit $56,000 from very wealthy grandparent, with the stipulation that for the first year, the money must be invested in two stocks paying 4% and 10% annual interest, respectively. How much should be invested at each rate if the total interest earned for the year is to be $3,200?

22. The length of a rectangular room is 2 feet longer than twice the width. If the room's perimeter is 208 feet, what are the room's dimensions?

23. Find the sum of the 50 terms of the arithmetic sequence: -3,4,11,18......

24. A new Hyundai Tiburon has a book value of $22,000, and after 2 years a book value of $14,000. What it the car's value in 4 years? Apply the formula $A = A_0 e^{rt}$. Round to the nearest hundred.

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