

Professor Katiraie MA103 Test Two Form A (Chapters 1,2,3,4,5,6, and 7.1) Fall 07

Name \_\_\_\_\_(1 Point)

Total Possible Points = 200 Points

Note: Show all work. Unless a problem is marked with an asterisk (\*), use a calculator only to check.

When asked for the equation of a line, the equation should be given in slope-intercept form.

1. Simplify:  $\left(\frac{x^{-3}y^7z^{-2}}{x^{-5}yz^{-4}}\right)^{-3}$  (Assume no variables are equal to zero.) (5 points)

**(Must Show Procedure)**

2. Let  $g(x) = x^2 + 7x + 6$  and  $f(x) = \frac{1}{2}x + 20$  (9 points)

a. Find  $x$  when  $f(x) = 6$

b. Find  $x$  when  $g(x) = 0$

c. Find  $f(4) + g(0)$

3. Write an equation of the line that passes through (1, 4) and is parallel to the line passing through the points (3, -6) and (-1, 2). (10 points)

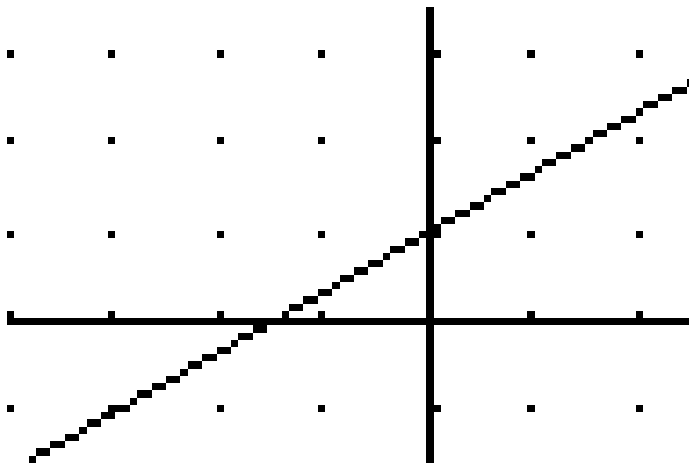
4. The monthly fees for a condo association can be modeled by the following formula:  
 $f(x) = 42x + 100$  where  $x$  is the number of years since the condo association was  
 built in 1985. **(Must Show Procedure)** (10 points)

\*a. What were the monthly fees in 2002?

b. Determine the year when the monthly fees were \$478?

c. Interpret the slope as a rate of change.

5. Find the equation of the line shown below on the graph. **(Must Show Procedure)** (8 points)



6. Find the equation of a line perpendicular to  $y = -3x + 7$   
 and passing through  $(-4, -2)$  **(Must Show Procedure)** (7 points)

7. Solve the following system of equations using Elimination method. (10 points)

$$\begin{cases} 2x + 3y = 6 \\ x - 2y = -4 \end{cases}$$

8. A student takes out two loans to help pay for college. One loan is at 11% simple interest, and the other is at 7% simple interest. The total amount borrowed is \$4000, and the interest after 1 year for both loans is \$380. Find the amount of each loan. (10 points)

9. A 10-foot wide sidewalk around a rectangular swimming pool has a total area of 2400 square feet. Find the dimensions of the swimming pool if the pool is 20 feet longer than it is wide. (10 points)

10. PERFORM THE OPERATION & SIMPLIFY:

(20 points)

a.  $\frac{3}{6x^2} - \frac{4}{21x^7}$

b.  $\frac{4}{x^2 + 3x} - \frac{1}{x^2 + 7x + 12}$

11. SOLVE FOR X:

$$\frac{x}{x+2} + \frac{7}{x-6} = \frac{14}{x^2 - 4x - 12}$$

(10 points)

12. SOLVE FOR X: *Check for extraneous solutions.*

(10 points)

$$\frac{12}{x - 5} - \frac{3}{x - 2} = \frac{5}{x - 2}$$

13. A vending machine will only accept quarters and dimes. When the coins are collected, the machine has 226 coins worth \$24.10. How many quarters were there? How many dimes? Show your work!

(10 points)

14. CONVERSIONS FROM EXPONENTIAL FORM TO RADICAL FORM AND VICE VERSA:

$$a^{m/n} = \left(a^{1/n}\right)^m = \sqrt[n]{a^m}$$

$$\sqrt{a b} = \sqrt{a} \sqrt{b}$$

$$x^m \bullet x^n = x^{m+n} \quad \frac{x^m}{x^n} = x^{m-n}$$

$$(x^m)^n = x^{mn}$$

$$x^{-m} = \frac{1}{x^m}$$

Simplify the following:

(14 points)

A.  $\sqrt[3]{-64}$

B.  $\sqrt{72x^{18}}$

C.  $\left(\frac{x^6}{27}\right)^{\frac{2}{3}}$

D.  $\sqrt{(x + 7)^{21}}$

E.  $\sqrt{\sqrt{y}}$

F.  $\sqrt{72x^8y^5}$

G.  $(x^2y^8)^{\frac{1}{2}}$

15. State the domain of the following functions. (10 points)  
Write your answer in set-builder notation:

a)  $g(x) = \frac{1}{x^2 + 81}$

b)  $f(x) = \frac{1}{3x - 2}$

c)  $h(x) = \frac{1}{x^2 - 9}$

d)  $f(x) = \frac{x^2 - 3x + 2}{x}$

16. Solve the following rational equations (8 points Each)

a)  $\frac{x}{x+2} = \frac{4}{x-3}$

b)  $\frac{5}{t-1} + \frac{2}{t+2} = \frac{15}{t^2 + t - 2}$

17. Perform the operation and Simplify the following expressions: (7.5 Points Each)

a)  $\frac{x^2 + 3x + 2}{2x + 2} \div \frac{-2x - 4}{x + 1}$

b)  $\frac{x^2 + 4}{x^2 - 4} \cdot \frac{x - 2}{x + 2}$

18. Perform the operation and Simplify the following expression expressions: (7.5 Points Each)

a)  $\frac{2}{t + 2} - \frac{t}{t^2 - 4}$

b)  $\frac{x}{x - 3} - \frac{2x}{x + 4}$