Professor Katiraie   MA 103   Test Two Form **B** (Chapters 1,2,3,4,5,6, and 7.1)

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: $\dfrac{16x^{-3}y^8z^2}{6xy^{-5}}$ (Assume no variables are equal to zero.)   (5 points)

(Must Show Procedure)

2.   Find the equation of a line passing through $(9,-3)$ and $(4,-8)$ (9 points)
(Must Show Procedure)

*3. If $y = -x^3 + x + 5$ use your calculator   .   (10 points)

a) Find the x-intercept

b) Find the y-intercept

4. The monthly fees for a condo association can be modeled by the following formula:
$$f(x) = 52x + 100$$
where x is the number of years since the condo association was built in 1999.
(Must Show Procedure)   (10 points)

*a. What were the monthly fees in 2002?

b. Determine the year when the monthly fees were $412?

c. Interpret the slope as a rate of change.

5.   **Translate** the following sentence into an equation and then
        solve the equation for x.
"If 2 is subtracted from 5 times x, it equals x plus 4"   **(Must Show Procedure)**

(8 points)

6. Find the equation of a line parallel to $-2x - 5y = 10$ and passing through $(4, -2)$
        (Must Show Procedure)   (7 points)

7.   Solve the following system of equations using Elimination method.

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

8. A student takes out two loans to help pay for college. One loan is at 8% simple interest, and the other is at 9% simple interest. The total amount borrowed is $4200, and the interest after 1 year for both loans is $363. Find the amount of each loan.

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. PERFORM THE OPERATION & SIMPLIFY: (10 points)

a. $\dfrac{3}{14x^2} + \dfrac{4}{35x^7}$

b. $\dfrac{4}{x^2 - 3x} - \dfrac{1}{x^2 - 5x + 6}$

11. SOLVE FOR X: $\dfrac{x}{x + 2} + \dfrac{7}{x - 6} = \dfrac{14}{x^2 - 4x + 12}$ (10 points)

12. SOLVE FOR X: *Check for extraneous solutions.* (10 points)

$\dfrac{2}{x - 5} - \dfrac{1}{x + 1} = \dfrac{5}{x + 1}$

13. Suppose you want to drive from Miami, Florida to Atlanta, Georgia. The speed limit is 70 mph in Florida and 65 mph in Georgia. The trip involves 473 miles of travel in Florida and 253 miles of travel in Georgia. Assume that you drive nonstop. (4 Points Each)

a. How long will the trip take if you drive at the speed limit for the whole trip?

b. Suppose you plan to drive above the speed limit. Let your speed be represented by **70 + x** in Florida and **65 + x** in Georgia, where **x** is the number of miles per hour over the speed limit you are willing to drive. Write the function T(X).

c. Find T(0). Compare to part 1.

d. Find T(10). Interpret this answer.

e. Find T(10) – T(0). Interpret the meaning in terms of driving from Miami to Atlanta.

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

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

SIMPLIFYING RADICAL EXPRESSIONS:

To simplify radical expressions, use the product property for radicals

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

Simplify the following: (20 points)

A. $\sqrt{200}$ B. $\sqrt{40x^{14}}$

C. $\sqrt{32x^9}$ D. $\sqrt{(x+7)^{15}}$

E. $\sqrt{(3x+5)^{18}}$ F. $\sqrt{27x^8y^5}$

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

a) $h(x) = \dfrac{1}{3x-9}$

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

c) $g(x) = \dfrac{1}{x^2-4}$

d) $f(x) = x^2 - 3x + 2$

16. Solve the following rational equations (10 points)

a) $\dfrac{5x}{x-1} = \dfrac{2x+1}{x-1}$

b) $3x = \dfrac{6}{2x+1}$

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

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

b) $\dfrac{b + 1}{b^2 - 1} \bullet \dfrac{b - 1}{b^2 + 1}$

18. Perform the operation and Simplify the following expression expressions:

(7.5 Points Each)

a) $\dfrac{x}{2x + 1} + \dfrac{1 - x}{5x}$

b) $\dfrac{2x}{x - 4} - \dfrac{x}{x + 4}$