MATH 0965 Spring 2018 **Mike McCraith**
Exam 1 **March 5 – 7, 2018**

DO NOT TURN THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

- **Write your name below on the space provided.**
- **This test has a total of 4 pages.**
- **Work the problem in the space provided. If you need more space, write on the back of the test. Be sure to label the test as to which problem is on the back.**
- **To insure maximum credit, show your work. In general, full credit will not be given for unsupported answers.**
- **Be sure to write neatly in pencil. If I cannot read what was written, do not expect the problem to be graded.**
- **If you finish early, go over the test again.**

Good luck!

Number	Maximum	Score
1	3	
2	4	
3	10	
4	10	
5	15	
6	10	
7	6	
8	5	
9	6	
10	10	
11	6	
12	5	
13	10	
Total	100	

Name _____

Circle Final Answers

1) (3 points) How do you find the domain of a rational function?

2) (4 points) Find the domain of the function $f(x)=\dfrac{x^2+4x+4}{x^2+9x+8}$:

3) (5 points each) Perform the indicated operation. You may leave the answer in factored form:

a) $\dfrac{x^2-2x-3}{x^2-6x-7}\cdot\dfrac{x^2-5x-14}{4x^2+8x}$

b) $\dfrac{10x-50}{x^2+6x+9}\div\dfrac{x^2-25}{x^2+8x+15}$

4) (5 points each) Perform the indicated operation. Be sure to simplify the numerator and reduce as needed. You may leave the denominator factored:

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

b) $\dfrac{x+1}{x^2+6x+9}+\dfrac{x+2}{x^2+8x+15}$

5) (5 points each) Simplify the complex fractions completely:

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

b) $\dfrac{\dfrac{x+1}{x^2-9}+5}{\dfrac{1}{x+3}}$

c) $\dfrac{a^{-2}+b}{7-a^{-1}}$

6) (5 points each) Solve for the variable:

a) $\frac{2}{x+4}+\frac{x}{x-7}=\frac{2}{x^2-3x-28}$

b) $\frac{5}{x+3}+\frac{8}{x-6}=\frac{x^2+6x}{x^2-3x-18}$

7) (2 points each) Short Answer: In this chapter, several of the sections dealt with using the LCD to complete the problem. Explain in each type of problem how the LCD was used. Do not give examples. Instead, give instructions as if you were explaining the process to someone who did not know:

a) Adding/Subtracting Fractions:

b) Simplifying Complex Fractions:

c) Solving Equations with Rational Expressions:

8) (5 points) Solve for *k* in the equation $\frac{2}{k}+\frac{3}{l}=\frac{1}{m+1}$:

9) (3 points each) Consider the two problems below. Give the steps necessary to complete the problem. **Do not actually complete the problem.** *Hint: Think about the directions that would be given for each problem type.*

a) $\frac{x^2+5x+6}{4x+4}-\frac{x+1}{x^2+2x+1}$

b) $\frac{x^2+5x+6}{4x+4}-\frac{x+1}{x^2+2x+1}=5$

10) (5 points each) SpongeBob and Patrick decide to race boats starting from the same place (despite the fact that SpongeBob does not have his boating license yet). 2 hours into the race, SpongeBob is 80 miles behind Patrick. Patrick is going twice as fast as SpongeBob.

a) How fast are they each going?

b) How far did each get after 2 hours?

11) (6 points) You and your siblings hold the most-awesome Math party of the year at your parents' home and end up making a mess in the process. Your parents, who you thought were away on vacation, are coming home in 5 hours. From past experience, you know that you can clean the house in 9 hours, your brother can do the job in 10 hours and your sister can do the job in 8 hours. If you work together, will you be able to clean the house before your parents get home? Be sure to show all necessary work to solve the problem.

12) (5 points) Suppose that a varies directly at the square of b. When a is 2, b is 5. Find the value of a when b is 7:

13) (5 points each) Goo-gon, a mystic warrior, swings a spiked ball on a chain above his head before he delivers a crushing blow to his enemy Mr. Sticky. See the illustration below. The tension T in the chain is directly proportional to the square of the speed s of the ball and inversely proportional to the radius r of the circle. If the tension in the chain is 24 pounds when the speed of the ball is 6 feet per second and the radius is 3 feet, find…

a) An equation for this situation including a value for k:

b) The tension when the speed is 8 feet per second and the radius is 2.5 feet: