

Print Name: \_\_\_\_\_

OSU name.#: \_\_\_\_\_

Instructor: \_\_\_\_\_

Signature: \_\_\_\_\_

**MATH 1075**

**Midterm Exam 2**

**Autumn 2019**

**Instructions:**

You have 55 minutes to complete this exam.

When applicable, mark answer bubbles completely like this ●, NOT like this ☒  
or ☑.

Circle or box all other final answers.

A calculator may be used given the calculator policy outlined in the syllabus.

Even if a calculator is used, you must show all work on each problem to receive full credit.

Write clearly and legibly to receive credit.

Do not round; give only exact answers (unless specified otherwise).

**Problem 1.** Identify the solution(s) to the equation below. Select all that apply. (5 pts)

$$5(3m + 1)(m - 2)(m + 7) = 0$$

- $m = -7$
- $m = -3$
- $m = 0$
- $m = 2$
- $m = 5$

**Problem 2.** Identify the restricted value(s) of the expression below. Select all that apply. (5 pts)

$$\frac{7t(t - 4)}{2(t - 1)}$$

- $t = 0$
- $t = 1$
- $t = 2$
- $t = 4$
- $t = 7$

**Problem 3.** The time it takes to drive from City A to City B varies inversely with the speed of the vehicle.

- (a) Write an equation that expresses the relationship between time, speed, and the constant of variation ( $k$ ). (4 pts)
  
  
  
  
  
  
  
  
  
  
- (b) It takes 12 hours for a car to complete the trip driving 50 miles per hour. Find the value of  $k$ . (3 pts)
  
  
  
  
  
  
  
  
  
  
- (c) How long would the trip take in a car driving 65 miles per hour? (3 pts)

**Problem 4.** Add. Simplify your final answer.

(13 pts)

$$\frac{9}{(4x+9)(x-3)} + \frac{3}{(4x+9)(x+4)}$$

**Problem 5.** Simplify the expression below.

(11 pts)

$$\frac{\frac{14}{x-8} - 7}{\frac{4}{x-8} - 2}$$

**Problem 6.** Simplify the rational expression.

(5 pts)

$$\frac{28w^4(w+6)^2(3w+2)}{32w^3(w+6)^3}$$

**Problem 7.** Solve the equation using the Zero Product Rule.

(8 pts)

$$(3x - 1)(x + 4) = 30$$

**Problem 8.** Divide. Simplify your final answer.

(7 pts)

$$\frac{3y}{2a} \div \frac{12y}{6ay}$$

**Problem 9.** A certain bathtub has two faucets, one for hot water and one for cold water. If both are turned on simultaneously, the two faucets can fill the tub in 8 minutes. The hot water faucet can fill the tub by itself in 12 minutes. How long would it take the cold water faucet to fill the tub by itself? (9 pts)

**Problem 10.** Multiply. Simplify your final answer.

(9 pts)

$$\frac{x^2 + 5x + 6}{x^2 - 4x + 3} \cdot \frac{x - 3}{4x + 12}$$

**Problem 11.** Solve the equation.

(11 pts)

$$\frac{G+5}{G+4} - 1 = \frac{G-1}{G-4}$$

**Problem 12.** Madelyn typically walks 8 miles per hour slower than she runs. One morning, she used a stopwatch on her daily run and found that she walks 6 miles in the same amount of time that she runs 18 miles. How fast does Madelyn walk?  
(7 pts)