Math 101, Fall 2017 Final Exam

Instructor's Name: _____

Directions

1. Time limit: 1 hour 50 minutes.

2. There are 100 points possible for this exam. The point value of each problem is shown.

3. For any partial credit to be possible, you must show work that explains how you obtained your answer or you must explain how you obtained your answer.

4. Your work must be neat, organized, and legible. Place answers on the line to the right of the problem where provided; otherwise box your solution.

5. You may use a calculator, but you may not use any notes, books or other sources. You may not use a cell phone, PDA, etc. and you may not share calculators. Use of a cell phone during the exam may result in a zero grade for this exam.

6. If a problem does not specify that an answer be written in fraction notation, mixed number notation, or decimal notation, then write the answer in the notation that you think is most appropriate for the problem. You should use exact answers unless otherwise noted. *All numerical fractions must be expressed in lowest terms.*

7. You are expected to do your own work. You are neither to receive nor to give any help on the exam.

I have read and agree to the directions above.

Signature:_____

Printed Name:_____

Date:_____

1. Combine like terms to simplify.

$wz + 2w^2z - 3w + 2zw^2 - wz$

Ans:_____(3)

2. Perform the indicated operations and simplify.

a) Multiply $(3x-5)(2x^2 - x + 2)$

Ans:_____(3)

b) Subtract $2x^2 + 2x - 1$ from $x^2 + x - 1$

Ans:_____(3)

c) Expand $(2x-3)^2$

Ans:_____(3)

d) Divide. $\dfrac{x^3 - 2x^2 + 4}{x + 2}$

Ans:_____(3)

3. Simplify each expression. Write each result using positive exponents only.

a) $\left(3xy^3\right)^{-2}$

Ans:_____(3)

b) $3^{-2}+3^{-1}$

Ans:_____(2)

c) $\dfrac{2a^3b}{4a^{-2}b^3}$

Ans:_____(3)

4. Solve.

a) $\dfrac{3}{14}=5x-\dfrac{1}{10}$

Ans:_____(3)

b) $2\left(8-x\right)+3=6x-2-x$

Ans:_____(3)

4. (Continued) Solve:

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

Ans:_____(3)

5. $|4x - 9| = |3 - 2x|$

Ans:_____(4)

6. Adam and Emily live 21 miles apart. They leave their respective homes at the same time walking towards each other. Emily walks twice as fast as Adam. If it takes them 2 hours to meet, what is Adam's speed?

Equation(s): _____(2)

_____

Ans:_____(1)

7. The population of Gotham city in 2015 was 1,064,000. This represents a 12% increase from the 2010 population. What was the 2010 population?

Ans:_____(3)

8. The population of Gotham city in 2015 was 1,064,000. Write the population in scientific notation.

Ans:_____(2)

9. Simplify each expression.

a) $2-3\left[5\left(2\cdot 3-1\right)-20\right]$

Ans:_____(2)

b) $\frac{3}{4}\div 2-\frac{2}{3}$

Ans:_____(2)

10. Evaluate each expression if $x = -2$ and $y = 3$.

a) $3-(2-x)$

Ans:_____(2)

b) $12 \div x \cdot y$

Ans:_____(2)

11. Solve $ax + by = c$ for y (assume that $b \neq 0$).

Ans:_____(3)

12. The sum of three consecutive odd numbers is 147. What are the three numbers?

Equation:_____(2)

Ans:_____(1)

13. Find an equation of each line.

a) Through (1,5) and (2,5).

Ans:_____(2)

b) Through (-1,2) and (2,4). Write the equation in **standard form** with integer coefficients.

Ans:_____(3)

c) Through the point (0,-4) and perpendicular to the line with equation $y = \frac{2}{3}x - 3$. Write the equation in **slope-intercept form**.

Ans:_____(3)

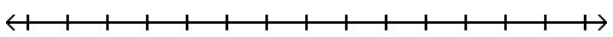
d) Through the point (2,3) and parallel to the line with equation $y = 8$.

Ans:_____(2)

14. Solve the following inequalities. Graph each solution set and write it in interval notation.

a) $4-3x<x$

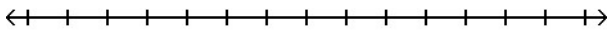
Graph (1)



Interval Notation:_____(2)

b) $2x\le -6$ and $x+3>-2$

Graph (1)



Interval Notation:_____(2)

15. Find the domain and range of the relation. Is the relation a function?
{(2,4), (3,4), (4,4), (5,6), (-5,6)}

Domain:_____(1)

Range:_____(1)

Function?:_____(1)

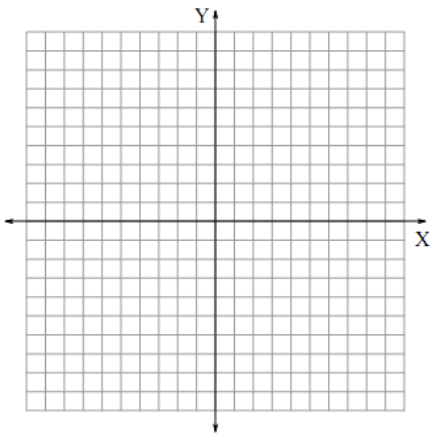
16. Consider the function $f(x)=\sqrt{x+2}$.

a) Find $f(7)$.

Ans:_____(1)

b) Graph the function $f(x)=\sqrt{x+2}$ by finding and plotting ordered pair solutions.

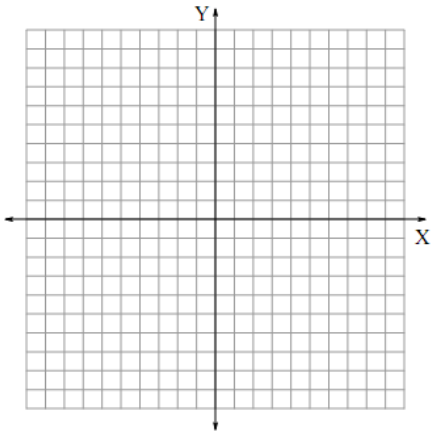
Graph (3)



17. Graph the linear equation by finding and plotting its intercepts.

$5x - 2y = -10$

Graph (2)



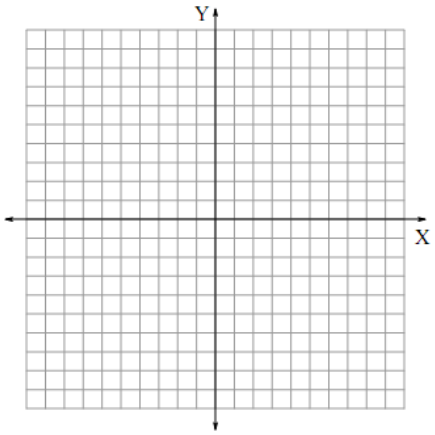
x-intercept:_____(1)

y-intercept:_____(1)

18. Graph the linear function using the slope and *y*-intercept.

$f(x) = -x + 6$

Graph (2)



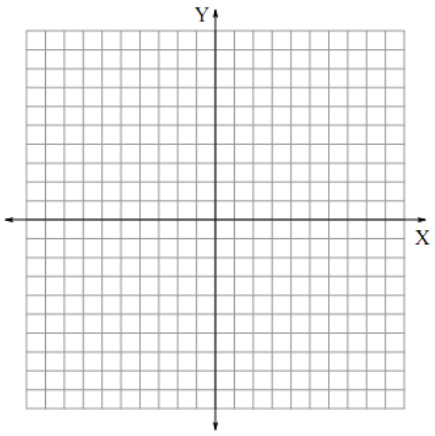
slope:_____(1)

y-intercept:_____(1)

19. Graph the solution of the system of linear inequalities.

$$\begin{cases} y < -\frac{1}{4}x + 2 \\ y \geq 2x \end{cases}$$

Graph (5)



20. Solve the system of equations by either the substitution method or the addition method.

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

Ans:_____(3)

21. JJ's Hamburger Stand sells only two items, hamburgers and sodas. On Friday, Mercedes and her friends purchased 6 hamburgers and 4 sodas for $32. On Saturday, they purchased 4 hamburgers and 3 sodas for $21.75. Let *x* represent the price of a hamburger and let *y* represent the price of a soda. Determine the price of a hamburger.

Equation(s):_____

_____(2)

Ans:_____(1)