Accelerated 65 - 95 Exam 1 Review Name: ___________________

1. When graphing a system of equations, what does the intersection of the two lines represent? What does it mean if there is no intersection?

2. Determine if the given point is a solution to the system of equations.

a. Is $(1, 1)$ a solution to:

$$y = x$$
$$y = -x + 2$$

b. Is $(3, 2)$ a solution to:

$$y = \frac{1}{3}x + 1$$
$$y = 3x - 7$$

3. Identify the slope and y-intercept of each of the following equaitons and then use them to solve the system of equations by graphing. Remember to write your solution in set notation.

a. $3x + y = 12$

$2y = x - 18$

b. $y = 2x - 3$

$-2x - 2y = -6$

4. Determine the solution to the system of equations by the *addition method*. Write the solution in set notation.

a. $x - 4y = -6$
$4x - 2y = 4$

b. $2x + 5y = 10$
$-3x + 2y = 4$

5. Determine the solution to the system of equations by the *substitution method*. Write the solution in set notation.

a. $2x - 3y = 5$
$x = 7y - 2$

b. $2x + 5y = 3$
$-4x - 10y = -6$

6. Let x represent the first number and let y represent the second number. Suppose two times the first number, decreased by three times the second number is -1. Also, the first number increased by twice the second number is 7. Use the given conditions to write a system of equations and then solve that system using either method. Check your solution.

7. Identify each polynomial as a monomial, a binomial or a trinomial. Give the degree of the polynomial.

   a. $y^4 - 2y^2 + 1$

   b. $6y - 5$

   c. 7

   d. $-9y^{192} + y$

8. Add or subtract the following polynomials:

   a. $(15y^3 - 6y + 2) + (10y^2 - y^3 + 3)$

   b.
   $$\begin{array}{r} 5x^4 - x^3 - 3x^2 \\ -(2x^3 - 3x^2 + x - 7) \\ \hline \end{array}$$

   c. $\left(\frac{1}{3}x^3 + \frac{2}{5}x - \frac{3}{4}\right) - \left(-\frac{2}{7}x^3 - \frac{3}{5}x + \frac{1}{4}\right)$

   d.
   $$\begin{array}{r} 5y^4 - y^3 + 7y \\ -(-y^3 - 5y^2 + 7y - 5) \\ \hline \end{array}$$

9. Multiply the following *by first distributing one polynomial into the other and* ***then*** *distributing a second time.* i.e. the long way.

   $\left(2x - \frac{1}{4}\right)(8x^3 - 12x^2 + 4x - 7)$

10. Determine whether each statement "makes sense" or "does not make sense" and explain your reasoning.

    a. A linear system having graphs with the same y-intercepts must have infinitely many solutions.

    b. When an inconsistent system is solved using the substitution method, a true statement, such as $1 = 1$, results.

    c. By first summing the exponents of each variable in each term of a polynomial in two variables, the degree of the polynomial can then be found by selecting the highest sum.

11. Simplify the following expressions by using the exponent rules gone over in class. Final forms should have only positive exponents.

a. $\frac{x^{100}y^{50}}{x^{25}y^{10}}$

d. $\frac{8x^3+6x^2-2x}{2x}$

b. $(100y)^0$

e. $\left(\frac{4x^5}{2x^2}\right)^{-4}$

c. $\frac{-5x^{10}y^{12}z^6}{50x^2y^3z^2}$

f. $\left(\frac{x^2}{y^3}\right)^{-3}$

12. Simplify the following expressions using scientific notation. Write the simplified form in BOTH scientific AND decimal notation.

a. $(3 \times 10^4)(3 \times 10^2)$

b. $\frac{180\times10^6}{2\times10^3}$

c. $(5 \times 10^2)^3$

13. *This problem will be in the calculator portion of the exam.* The Andromeda Galaxy is approximately 2.54×10^6 light years from the Milky Way Galaxy that we live in. Now, a light years is NOT a measure of time, it is a measure of DISTANCE. In fact, 1 light year is approximately 9.46×10^{15} meters. Use this information to determine approximately how many meters the Andromeda Galaxy is from the Milky Way Galaxy. Do your calculations and write your answer in scientific notation.

14. A rectangular lot whose perimeter is 320 feet is fenced along three sides. An expensive fencing along the lot's length costs \$16 per foot. An inexpensive fencing along the two side widths costs only \$5 per foot. The total cost of the fencing along the three sides comes to \$2140. What are the lot's dimensions?

15. You are choosing between two long distance telephone plans. Plan A has a monthly fee of \$20 with a charge of \$0.05 per minute for all long-distance calls. Plan B has a monthly fee of \$5 with a charge of \$0.10 per minute for all long-distance calls. How many minutes used will result in both plans costing the same amount? What is this amount that they will both cost?

16. How many ounces of a 15% alcohol solution must be mixed with 4 ounces of a 20% alcohol solution to make a 17% alcohol solution?

17. The functions f and g are given below in a table and a graph. Answer the questions below using these functions.

x	-4	-2	0	1	3	5
$f(x)$	8	5	3	0	-2	-6

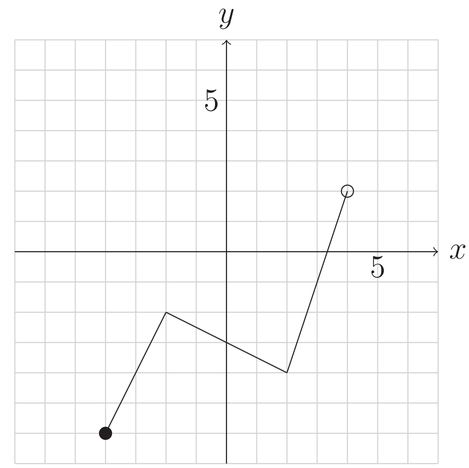


Figure 13: $g(x)$

a. Find the following

i. $f(3) =$ ____________

ii. $f(-2) =$ ____________

iii. $g(0) =$ ____________

iv. $g(2) =$ ____________

v. When $f(x) = 5$, then $x =$____________ .

vi. When $g(x) = -1$, then $x =$____________ .

vii. When $g(x) = -4$, then $x =$____________ .

b. What is the domain of g?

c. What is the range of g?

d. Find all x for which $g(x) > -1$

18. Given $g(x) = \frac{x}{x+2}$, find each of the following and write the corresponding ordered pair:

a. $g(2)$

c. $g(0)$

b. $g(-3)$

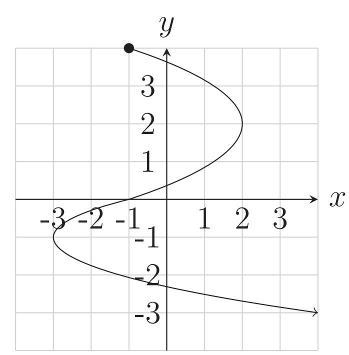
d. $g(-1)$

19. Determine whether the following relationships between inputs and outputs can be categorized as a function and justify your response. State the domain and range of both relations.

a. $\{(-2,7),(3,4),(5,9),(2,4),(3,-7)\}$

b. $\{(2,.5),(-7,.5),(-1,.5),(3,2),(4,2)\}$

c.



20. What is the one requirement for a relationship between inputs and outputs to be considered a function?

21. What is the definition of a solution to an equation in one variable?

22. For the next two problems, set up two functions, one to represent each side of the equation then solve the equation numerically (using the function name in your header), symbolically, and graphically (labeling both graphs using the correct function name). State a conclusion using a full sentence and proper set notation.

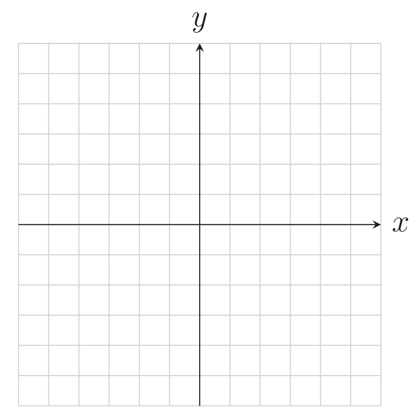
a. $2x + 3 = 5$

i. Numerically:

ii. Symbolically:

$2x + 3 = 5$

iii. Graphically:



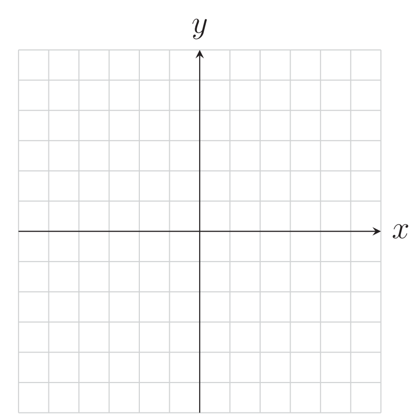
b. $x - 2 = -2x + 1$

i. Numerically:

ii. Symbolically:

$x - 2 = -2x + 1$

iii. Graphically:



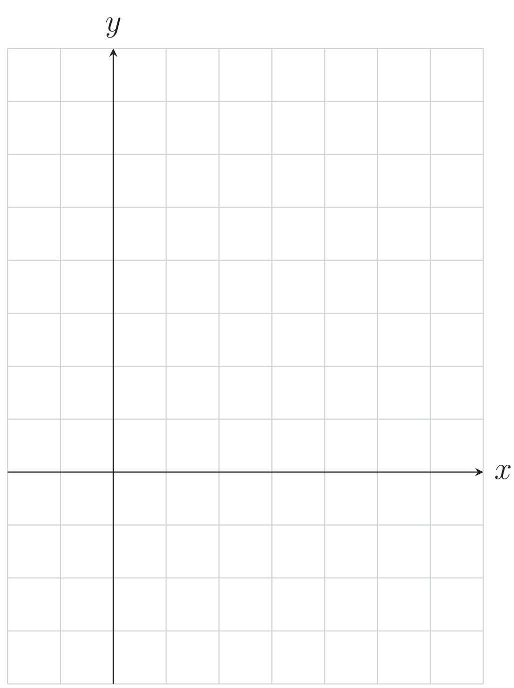
23. For the next two problems, set up two or three functions, one to represent each side of the equation then solve the equation numerically (using the function name in your header), symbolically, and graphically (labeling both graphs using the correct function name). State a conclusion using a full sentence and proper set notation.

a. $2x - 4 < -2$ or $2x - 4 \geq 6$

a. Numerically:

b. Symbolically:

c. Graphically:

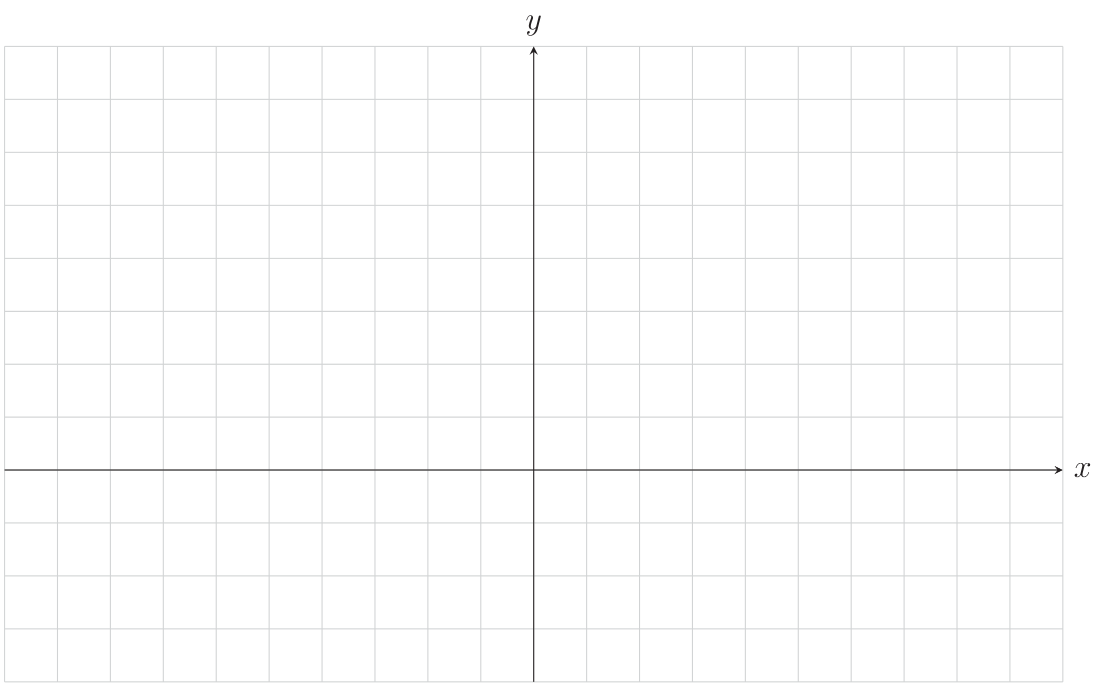


b. $-2 \leq -\frac{1}{2}x + 2 < 6$

a. Numerically:

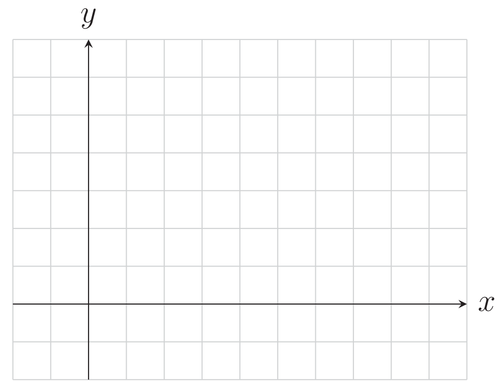
b. Symbolically:

c. Graphically:

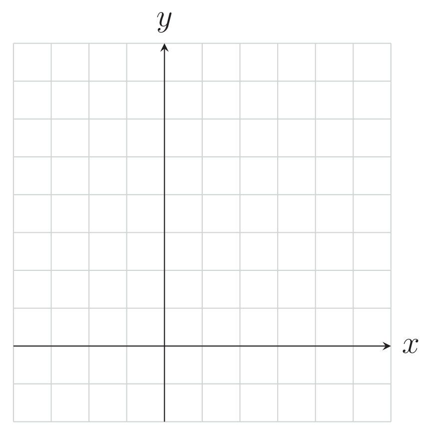


24. Solve the following equations and inequalities graphically.

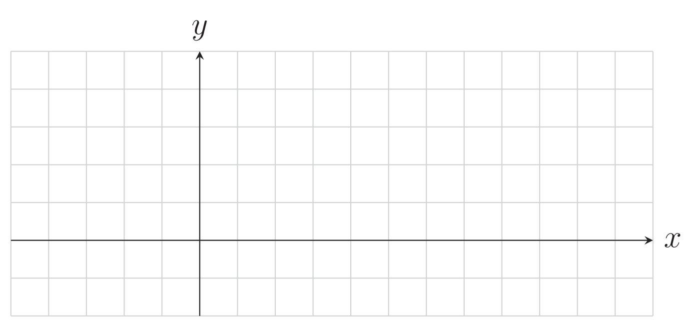
a. $|5 - x| = 3$



b. $|-2x + 2| \geq 6$



c. $\left|\frac{-1}{2}x + 2\right| < 3$



25. Solve the following equations and inequalities numerically.

a. $\left|\frac{2}{3}x - 5\right| < 3$

26. Solve the following equations symbolically.

a. $|5 - 3x| - 3 = 1$

b. $|2x| = |x - 3|$

c. $|2x - 5| > -1$

d. $-2|5x - 1| \geq 5$