

Coordinate Algebra

Final Exam Review – Fall Semester 2014

Name _____ Class Period _____

The Final Exam is a cumulative, multiple-choice test that covers all material from the beginning of the school year (Units 1 – 3). Please review all of your notes, homework assignments, quizzes, and tests to prepare for the Final Exam. The following is a guide to help you, but it is not the only source you should use to prepare for the Final Exam.

Unit 1 Topics

Be able to simplify expressions using the order of operations

Be able to solve linear equations

Be able to solve linear equations for an indicated variable

Be able to solve and graph inequalities with one variable

Know and be able to use the properties of exponents to simplify expressions

Looking at a table, graph, or equation, be able to determine whether the relationship is linear or exponential (growth or decay)

Using a given table of values, write a linear equation that represents the data

Graph linear equations

Given an expression, determine the variables, terms, coefficients, and constants

How to compute unit conversions

Unit 1 Practice Problems

1. Find 2 consecutive integers whose sum is 225.
2. A rectangle is 7 cm longer than it is wide. Its perimeter is at least 58 cm. What are the smallest possible dimensions for the rectangle?
3. Name the terms, variables, coefficients, and constant of the expression.

$$7x^5 - 6x^2 + 8y - 2z + 9$$

Evaluate each expression.

4. $300 \div [2(2 + 3)^2]$

5. $3 \cdot 6 + 9 \div 3 - 6$

6. $\frac{8^2 - 6(4)}{2(5)} - 6$

7. $\frac{6^2 - 4^2}{2(3-2)} - 2^4$

8. Convert 3 days to seconds.

9. You are traveling in a car that is moving at 65 mph. How fast is that in feet per minute?

Solve and graph the following inequalities.

10. $-x \leq -5$

11. $x - 6 < 13$

12. $-3x + 2 > 14$

13. $8p \leq 7p + 20$

Solve each equation.

14. $6(3n - 5) - 7n = 25$

15. $\frac{x+5}{5} = -3$

16. $4 = 5r - 16$

17. $\frac{3}{4}g = -27$

Create a linear equation (slope – intercept form) for each given table.

18.

X	Y
0	22
1	44
2	66
3	88

19.

X	Y
0	-5
1	3
2	11
3	19

Simplify. Make sure your answer has no negative exponents.

20. $x^4 \cdot x^5$

21. $(3k^4)^2(k^6)$

22. $(8c^{-5})^{-2}$

23. $9x^0$

24. $\left(\frac{w^2}{xy^3}\right)^6 \cdot \left(\frac{3x}{y}\right)^4$

25. $\left(\frac{5}{7}\right)^{-2}$

Solve for the indicated variable.

26. Solve for x: $y = -4x + 16$

27. Solve for r: $M = \frac{1}{3}\pi r$

State whether each table represents an EXPONENTIAL GROWTH or an EXPONENTIAL DECAY function.

28.

X	Y
1	128
2	64
3	32
4	16

29.

X	Y
1	3
2	9
3	27
4	81

- 30. Enzo is celebrating his birthday and his mom gave him \$50 to take his friends out to celebrate. He decided he was going to buy appetizers and desserts for everyone. It cost 5 dollars per dessert and 10 dollars per appetizer. Enzo is wondering what kind of combinations he can buy for his friends.**
- a) Write an equation using 2 variables to represent Enzo's purchasing decision.
(let a = number of appetizers and d = number of desserts)**
- b) Use your equation to figure out how many desserts Enzo can get if he buys 4 appetizers.**
- c) How many appetizers can Enzo buy if he buys 6 desserts?**

Unit 2 Topics

Know the properties of equality and properties of operations:

Addition Property of Equality

Subtraction Property of Equality

Multiplication Property of Equality

Division Property of Equality

Substitution Property of Equality

Reflexive Property of Equality

Symmetric Property of Equality

Transitive Property of Equality

Commutative Property of Addition

Commutative Property of Multiplication

Associative Property of Addition

Associative Property of Multiplication

Distributive Property

Identity Property of Addition

Identity Property of Multiplication

Property of Zero

Additive and Multiplicative Inverses

Solve a linear system of equations by graphing, substitution, and elimination

From a word problem, be able to write a system of equations and solve it

Be able to graph linear inequalities in two variables

Be able to solve systems of linear inequalities

Be able to solve an equation and write out the reason for each step in the process

Solve exponential equations

Unit 2 Practice Problems

Solve for x.

1. $3^x = 81$ 2. $2^x = \frac{1}{16}$ 3. $6^x - 8 = 28$ 4. $\left(\frac{1}{25}\right)^{3x-9} = 5^{3x}$

Solve the linear system of equations by using the graphing method.

5. $y = -x + 3$
 $y = x + 1$ 6. $y = -2x + 7$
 $-3x + 6y = 12$

Solve the linear system of equations by using the substitution method.

7. $y = 2x - 2$
 $6x + 2y = 16$ 8. $4x - y = -6$
 $y = 2x + 2$

Solve the linear system of equations by using the elimination method.

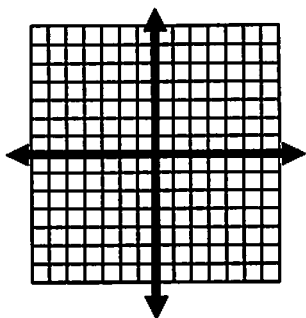
9. $5x - 3y = 7$
 $x + 3y = 5$ 10. $-3x + 3y = -9$
 $6x + 2y = 2$

Systems of Linear Equations Word Problems:

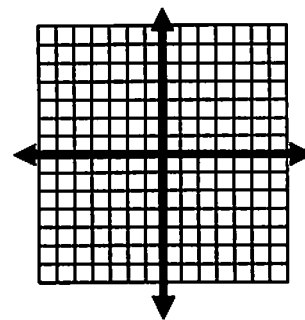
11. A store sold 32 pairs of jeans for a total of \$1050. Brand A sold for \$30 per pair and Brand B sold for \$35 per pair. Use a system of linear equations to determine how many of Brand B were sold?
12. You are selling tickets for a basketball game. Student tickets cost \$3 and general admission tickets cost \$5. You sell 350 tickets and collect \$1450. Use a system of linear equations to determine how many student tickets you sold?

Graph the following, showing the solutions.

13. $x - 3y \leq -9$



14. $y > -x + 2$
 $4x + y < -1$



Write the reason for each step in solving the equation.

15.

Steps to Solve the Equation	Reasons for Each Step
$3(x - 2) + 12 = 48$	
$3x - 6 + 12 = 48$	
$3x + 6 = 48$	
$3x = 42$	
$x = 14$	

Unit 3 Topics

Know the characteristics of functions:

Domain – values of x, input, look left to right

Range – values of y, output, look down to up

Minimum Point – lowest point on the graph

Maximum Point – highest point on the graph

X – intercept – where the graph crosses the x – axis

Y – intercept – where the graph crosses the y – axis

Interval of Increase – function rises from left to right, write values of x

Interval of Decrease – function falls from left to right, write values of x

End Behavior – look at arrows, write the value that y is approaching

Asymptote – a line that the function gets closer and closer to, but never touches or crosses

Determine if a relation is a function by looking at a graph, table, or mapping

Be able to state the domain and range of a function

Be able to evaluate functions

Be able to add, subtract, multiply, and divide functions

Explicit Arithmetic and Geometric Sequences

Be able to calculate rate of change

Be able to compare linear and exponential functions

Be able to write linear and exponential equations from word problems

Understand the transformations of functions being given a graph and equation

Be able to solve growth and decay function problems

Be able to solve compound interest problems

Unit 3 Practice Problems

Find the following using the three given functions.

$$f(x) = 5x - 1$$

$$g(x) = x^2 - 4$$

$$h(x) = x^3 - x$$

1. $g(4)$

2. $h(-3)$

3. $f(3x+4)$

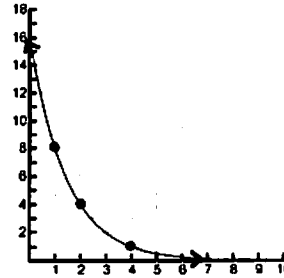
4. $2h(x) - 2g(x)$

Use the graph to answer the following.

5. $f(2) =$ _____

6. $f(4) =$ _____

7. $f(\text{_____}) = 8$



Find the rate of change.

8. $(7,-4)(6,-3)$

9. $f(x) = -2x + 4$, when $x_1 = 1$ and $x_2 = 3$.

10. From 1 years to 3 years.

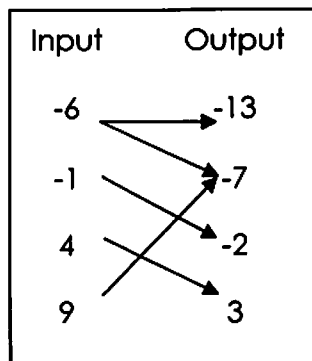
11. $g(x) = 3x - 2$ when $x_1 = -2$ and $x_2 = 4$.

t (Years)	1	2	3	4
f(t)	4	8	10	16

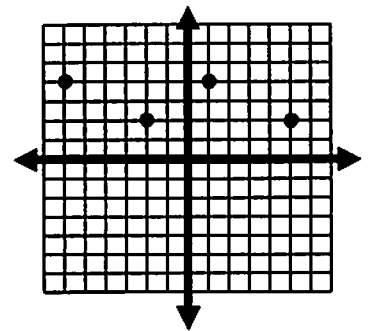
Determine whether the relation is a function. If it is a function, state the domain and range.

12. $\{(-3,0),(4,1),(3,2)\}$

13.



14.



15. Write a general rule for the nth term. Then find a_{17} .

2, 7, 12, 17, ...

16. Write a general rule for the n th term. Then find a_7 .

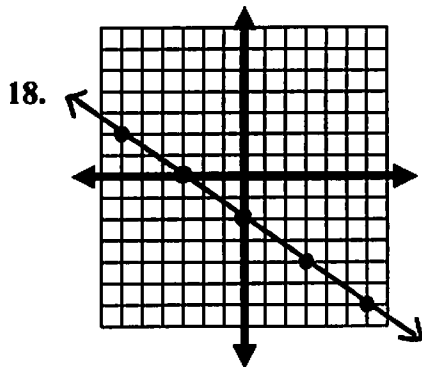
8, 4, 2, 1, ...

17. Bailey and Toby are siblings. They both want to become good runners. They each devise a separate workout plan to improve their running. Bailey is going to start with 30 minutes of running and increase her running by 5 minutes each day. Toby is going to start with 20 minutes of running and increase his running by 10 minutes each day.

a) Write a function for each person.

b) On what day will Bailey and Toby be running the same amount of time?

For the function find the following characteristics.



Domain: _____

Range: _____

x-intercept(s): _____

y-intercept(s): _____

Interval of Increase: _____

Interval of Decrease: _____

Maximum Point: _____

Minimum Point: _____

End Behavior: As $x \rightarrow \infty$, $y \rightarrow$ _____

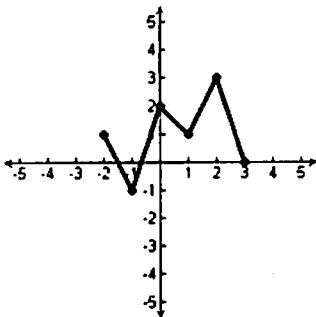
As $x \rightarrow -\infty$, $y \rightarrow$ _____

19. Sherry has a huge doll collection of 80 dolls. Her mom tells her that she needs to get rid of 5 per year to get it down to a decent number before leaving for college. Write an explicit formula to model the number of dolls per year. If she is 12, how many will she have left when she is 18?
20. You bought a Boston Whaler in 2004 for \$12,500. The boat's value depreciates by 7% a year. How much is the boat worth now (in 2014)?
21. The population of a large city increases by a rate of 3% a year. When the 2000 census was taken, the population was 1.2 million. Write a model for this population growth.

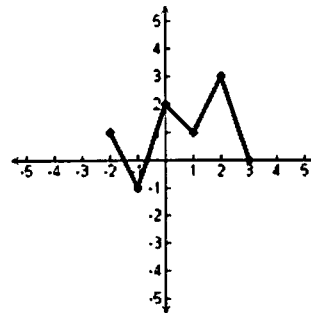
22. Describe the transformations made to $f(x) = 3^x$ to draw the following function. $h(x) = -2(3)^{x+1}$

23. Give the domain, range, and asymptote for: $g(x) = \frac{1}{4}3^{x-2} + 5$.

24. Sketch the graph of $-f(x)+2$.



25. Sketch the graph of $2f(x) - 1$.



****All Review Worksheets that were given for Quizzes and Tests throughout the semester are still posted on the blog with solutions. These would also be a great resource to help you prepare for the Final Exam.**