

Take home semester 1 exam

Worth 50/100 points

Due right before exam

Student’s Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (print neatly)

Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

All work is neat and shown on a **separate sheet of paper**/graph paper as needed

*(5 points will be subtracted for each: graphs without graph paper and work that is not readable)*

**By signing the statement below, you agree that you understand the following:**

The second half of your exam (in class exam) will be the SAME **10 questions** out of this take home test (in **multiple choice form**). I also understand that the answers to this take home semester exam are posted on Mrs. Simpson’s website simpsonmathcordova.weebly.com and will be **removed on Sunday** night before the exams. If you submit the final answers only, you will receive a “0” on this part of the exam. All work is neat and shown on a **separate sheets of paper**/graph paper as needed.

*(5 points will be subtracted for each: graphs without graph paper, missing info on this page and work that is not readable)*

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Note from the teacher:

*4 different versions of the in class exam will be made. Therefore, study these questions by trying to understand the procedures, not just memorizing.*

***If you really care about your grade, this is the time to show it!!!!!!!!!!!!!!!!!!***

**ALGEBRA 2 EXPRESSIONS, EQUATIONS AND INEQUALITIES CHAPTER 1**

1. Simplify by combining like terms.

a. 8r – 3s – 5r b. 8r – (3s – 5r)

1. Evaluate each expression for the given values of the variable.
   1. 2x(x – 1) – x2 for *x* = -2 b. (3x – 6) – (6 – 4x)for *x* = 5
2. Determine whether the equation is *sometimes, always,* or *never* true.
   1. 1 + 5x – 6 = 6x – 5 – x b. -x + 2(5x – 1) = 2(3x + 4) + x
3. Solve the inequality. Graph the solution set.

a. 8 + 4*k* 16 b. 5(2*b* + 2) < 2 + 12*b*

1. Solve the compound inequality. Graph the solution set.

a. 10*x* – 3 < –43 or 7*x* + 11 > –10 b. - 8 ≤ 2x – 4 < 6

1. Solve the absolute value equation. a. |2*x* + 5| = 9 b. 
2. Solve the absolute value inequality. Graph the solution set.

a. |4x + 3| < 5 b. |2x + 6| ≥ 10

**ALGEBRA 2 FUNCTIONS, EQUATIONS AND GRAPHS CHAPTER 2**

1. Is the relation a function? State the domain and range.
   1. {(14, 15), (5, 7), (3, 10), (11, 1), (5, 8)} b. {(1, 2), (3, 2), (6, 2), (10, 2), (25, 2)}
2. For each function, what is the output of the given input?
   1. For  b. For 
3. What is the slope of the line that passes through the given points (-3, 7) and (4, 15)?
4. Write the equation in **slope-intercept form**. What are the slope and y-intercept? What is the graph of the equation 3*x* – *y* = 1?
5. Write an equation of the line, in **point-slope form**, that passes through the two given points

(-10, 18) and (6, -14).

1. What is the equation of the line  in **standard form**? Use integer coefficients.
2. What are the x and y intercepts of the equation -4*x* – 6*y* = 24? Graph the equation.
3. What is the equation of the line perpendicular to  through (3, 3) in **slope-intercept form**?
4. Graph the absolute value equation y = |x + 3| - 4?
5. Without graphing, what are the vertex, axis of symmetry, and transformations of the parent function? y = 7 |x – 3| - 6
6. What is the graph of t is the graph of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_f the parent function? t is the graph of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_f the parent function? t is the graph of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_f the parent function? t is the graph of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_f the parent function? 2x - 2y ≤ -4

**ALGEBRA 2 LINEAR SYSTEMS CHAPTER 3**

1. Solve the system by **graphing**.

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Solve the system by **graphing**.

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1. Solve the system using **elimination.**

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1. Solve the system using **substitution.**

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**ALGEBRA 2 QUADRATIC FUNCTIONS AND EQUATIONS CHAPTER 4**

1. Graph the function 
2. Graph the function 
3. Solve by factoring =0
4. Solve by factoring =0
5. Solve the quadratic equation by **COMPLETING THE SQUARE** 
6. Use the **QUADRATIC FORMULA** to solve the equation.



1. Simplify the number using the imaginary number *i*.

a) b)

1. Simplify the expressions

a) *i* 5 b)

c)  d)

**ALGEBRA 2 POLYNOMIALS AND POLYNOMIAL FUNCTIONS CHAPTER 5**

1. Classify 8*x*4 + 7*x*3 + 5*x*2 + 8 by degree and by number of terms. State the number of turning points.
2. If the function has 4 turning points, what is the degree of that function?
3. What is the end behavior for the graph of y = -3*x*4 - 9*x*3 + *x*2 + 1?
4. What are the zeros of the function P(x) = (*x* + 3)(*x* – 3)(*x* + 4)? Sketch the graph of the polynomial.
5. Given that p(5)=0, p(2)=0, and p(-5)=0, find such polynomial p(x)?
6. Factor then find real and imaginary solutions of 64*x*3 – 1 = 0
7. Find all real and imaginary solutions of x4-16 =0
8. Divide 4*x*3 + 2*x*2 + 3*x* + 4 by *x* + 4 using long division.
9. Divide *x*3 + *x*2 – *x* + 2 by *x* + 4 using synthetic division.
10. Is *x* – 2 a factor of P(*x*) = *x*3 + 2*x*2 – 6*x* - 4? If it is, what are the other two roots?
11. Use the Rational Root Theorem to list all possible rational roots of the polynomial equation *x*3 - 6*x*2 + 4*x* + 9.
12. A polynomial equation with rational coefficients has the roots  and . Find one such polynomial.
13. A cubic polynomial with rational coefficients has the roots and 2/5. Find one such polynomial
14. What does Descartes' Rule of Signs tell you about the real roots of the polynomial

-3*x*3 + *x*2 – *x* – 6 = 0?

**ALGEBRA 2 RADICAL FUNCTIONS AND RATIONAL EXPONENTS CHAPTER 6**

Simplify.

46.  47. 

48. Solve  49.  50. 