Algebra 2 Final Exam Review Fall 2014

From Test 1

1. State the solution to each compound inequality.

a) $W < 8$ *AND* $W > 9$ b) $A \geq -9$ *OR* $A \leq 12$

c) $E > 6$ *OR* $E > 10$ d) $B > 0$ *AND* $B < 2$

e) $M \leq 6$ *AND* $M \leq 20$

2. Solve each equation for W. State the restrictions on the variables, if any.

a) $A(W + G) - K = M$ b) $\frac{EW - A}{T} + M = C$

3. Use the following functions: $f(x) = x^2 - 3x$ $g(x) = \frac{5x}{x+1}$ $h(x) = x + 4$

a) Find $f(h(x))$. Simplify as much as possible.

b) Find $g(h(x))$. Simplify as much as possible. c) Find $f(h(2))$

Chapter 3 and Sec 4-7

Solve each system of equations. State each solution as an ordered pair. Write No Solution or Many Solutions when necessary.

1. $y = 2x - 3$
$4x - 5y = -15$

2. $2x + 4y = 12$
$3x + 6y = -24$

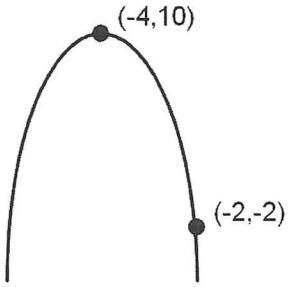
3. $7A + 6B = -36$
$3A - 4B = -22$

4. $2P + 6Q = 8$
$5P + 15Q = 20$

5.
$4x - 5y + 2z = 26$
$-x + 3y - 6z = -20$
$7x + y = 11$

From Chapter 5

1. Write the equation of this parabola in Vertex Form: $y = a(x - h)^2 + k$



Problems 2 and 3: For each quadratic answer the following:

a) State the equation for the line of symmetry
b) State the coordinates of the vertex
c) State the y-intercept
d) Tell if the parabola has a maximum or a minimum.

2. $y = -2x^2 - 16x + 13$

3. $y = 3(x - 1)^2 + 6$

4. Solve by factoring:

a) $6x^2 - 15x = 0$ b) $2x^2 + 6x - 20 = 0$ c) $2x^2 + x - 10 = 0$ d) $2x^3 + 7x^2 - 18x - 63 = 0$

5. Find all real and imaginary solutions using square roots:

a) $5 + 3x^2 - 7 = 19$ b) $(x+3)^2 + 24 = 8$

6. Find all real and imaginary solutions using the quadratic formula. Give all real solutions rounded to the nearest hundredth and simplify all imaginary solutions.

a) $4x^2 + 20x - 1 = 0$ b) $x^2 - 4x + 29 = 0$

7. An object is shot into the air from the top of a 30 foot building. The following equation models the height of the object as a function of time. $h(t) = -16t^2 + 200t + 30$

a) Find the time to reach it's maximum height.

b) Find the maximum height.

c) Find the time to return to the ground.

8. Find each product: a) $(2+4i)(5-3i)$ b) $(2+7i)^2$ c) $(6+7i)(6-7i)$

Algebra 2 Final Exam Review Fall 2014

Chapter 6 1. Find all real and imaginary solutions by factoring.

a) $2x^5 - 10x^3 - 72x = 0$ b) $3x^3 - 2x^2 + 12x - 8 = 0$ c) $5x^5 - 80x = 0$

2. State the Degree and Leading Coefficient of each polynomial.

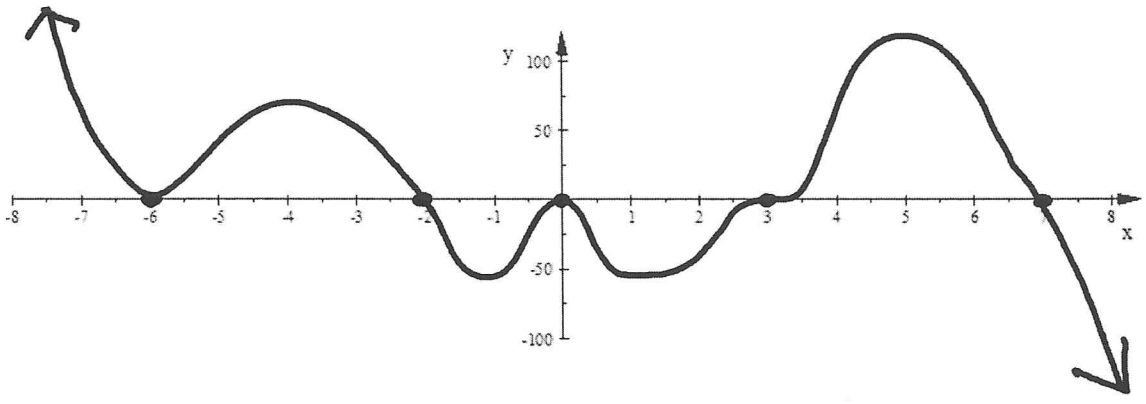
a) $5x^3 - 3x^2 + x^5 - 9x + 12$ b) $-10x^2(5x+6)^2(2x-1)^3(x+3)$

3. State the end behavior of each polynomial.

a) $y = 5x^4 + 6x^3 - 7x + 1$ b) $y = -x(x+6)^2(x-7)^2(x+4)$

c) $y = -2x^5 + 8x^4 - 9x^2 + 10x$ d) $y = x^3(x+3)^2(x+7)(x-1)$

4. Write the equation of the polynomial shown in the graph.



5. Find each quotient. a) $\dfrac{3x^4 - 8x^3 + 7x^2 + 4x - 9}{x - 2}$ b) $\dfrac{8x^3 + 22x^2 - 25x + 3}{4x - 3}$

Chapter 9 Algebra 2 Final Exam Review Fall 2014

1. Is each table an example of Direct Variation, Inverse Variation, or neither. If the table represents Inverse or Direct Variaton write a variation equation and find the value of x when $y = 200$.

a)

x	y
2.5	25.6
8	8
40	1.6
50	1.28

b)

x	y
4	20
8	30
12	40
16	50

c)

x	y
−6	−45
8	60
12	90
18	135

2. W varies directly with the product of M and the cube of T and inversely with the square of C. $W = 4.8$ when $M = 12$, $T = 2$, and $C = 5$. Write the equation of this relationship. Round the variation constant to the nearest hundredth as necessary.

3. Simplify this rational expression. State the restrictions on the variable. $\dfrac{12x^3 - 108x}{8x^5 - 16x^4 - 120x^3}$

4. Simplify the product. $\dfrac{2x^3 - 50x}{x^2 - 8x + 15} \cdot \dfrac{x - 2}{4x^2 + 12x - 40}$

5. Find the sum. $\dfrac{2}{x^2 - x - 6} + \dfrac{5}{x^2 - 4}$

6. Simplify. $\dfrac{\frac{2}{xy} + \frac{8}{x^2}}{\frac{7}{y^3} + 3}$

7. Solve $\dfrac{3}{x + 3} + \dfrac{5}{x^2 - 3x - 18} = \dfrac{1}{x - 6}$

8. Use this function: $y = \dfrac{2x(x - 9)(x + 3)(x + 2)}{4x(x + 7)(x + 2)(x - 4)}$

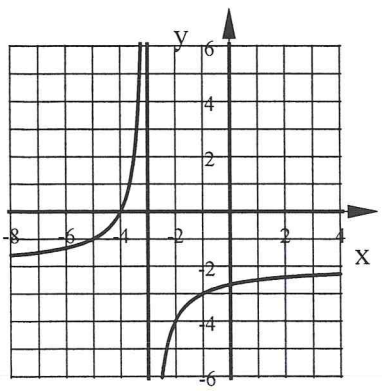
a) State the Holes of this function, if any.

b) State the Vertical asymptotes of this function, if any.

9. Find the horizontal asymptote of each, if any.

a) $\dfrac{4x^2 - 6x + 3}{2x + 9}$ b) $\dfrac{15x^3 + 6x^2 - 19}{3x^3 - 2x^2}$ c) $\dfrac{24x^2 + 18x - 25}{4x^3 + 3x^2 - 5}$

10. Write the equation of the graph shown which is a transformation of $y = \dfrac{2}{x}$



Alg 2 Final Exam Review ANSWERS Fall 2014

From Test 1

1. a) No Sol b) All Real Numbers c) $E > 6$ d) $0 < B < 2$ d) $M \le 6$
2. a) $W = \frac{M+K}{A} - G$ or $W = \frac{M+K-GA}{A}$ $A \neq 0$
   b) $2 = \frac{(C-M)T+A}{E}$ $E, T \neq 0$
3. a) $f(h(x)) = x^2 + 5x + 4$ b) $g(h(x)) = \frac{5x+20}{x+5}$ c) $f(h(2)) = 18$

Ch 3 & Sec 4-7

1. $(5,7)$ 2. No Sol 3. $(-6,1)$ 4. Many Solutions 5. $(2,-3,1.5)$

From Chapter 5

1. $y = -3(x+4)^2 + 10$
2. a) LOS: $x = -4$ b) Vertex $(-4,45)$ c) $y - int = 13$ d) Max
3. a) LOS: $x = 1$ b) Vertex $(1,6)$ c) $y - int = 9$ d) Min
4. a) $x = 0, \frac{5}{2}$ b) $x = -5, 2$ c) $x = 2, -\frac{5}{2}$ d) $x = 3, -3, -\frac{7}{2}$
5. a) $x = \pm\sqrt{7}$ b) $x = -3 \pm 4i$ 6. a) $x = -5.05, 0.05$ b) $x = 2 \pm 5i$
7. a) 6.25 sec b) 655 ft c) 12.65 sec
8. a) $22 + 14i$ b) $-45 + 28i$ c) 85

Chapter 6

1. a) $x = 0, \pm 3, \pm 2i$ b) $x = \frac{2}{3}, \pm 2i$ c) $x = 0, \pm 2, \pm 2i$
2. a) Degree = 5 Lead. Coef.= 1 b) Degree = 8 Lead. Coef. = –2000
3. a) ↖, ↗ b) ↙, ↘ c) ↖, ↘ d) ↙, ↗
4. $y = -x^2(x+6)^2(x+2)(x-3)^3(x-7)$
5. a) $3x^3 - 2x^2 + 3x + 10$ $R = 11$ b) $2x^2 + 7x - 1$

Chapter 9

1. a) Inverse Variation, $xy = 64$ or $y = \frac{64}{x}$, $x = 0.32$ when $y = 200$
   b) Neither
   c) Direct Variation, $y = 7.5x$ or $\frac{y}{x} = 7.5$, $x = 26.67$ when $y = 200$
2. $W = \frac{1.25MT^3}{C^2}$ 3. $\frac{3(x-3)}{2x^2(x-5)}$ $x \neq -3, 0, 5$
4. $\frac{2}{x(x-3)}$ $x \neq 2, 3, \pm 5$ 5. $\frac{7x-19}{(x-3)(x+2)(x-2)}$ 6. $\frac{2xy^2 + 8y^3}{7x^2 + 3x^2y^3}$ 7. $x = 8$

#'s 8 to 10 won't be on the final exam.