Algebra 2   Final Exam Review   Fall 2013

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 $E > 10$

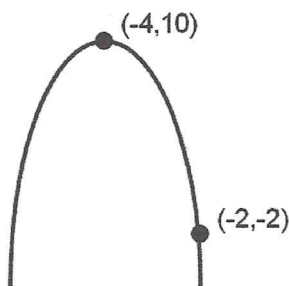d) $B > 0$ AND $B < 2$ e) $M \leq 6$ AND $M \leq 20$

2. Solve each system of equations using any method.

a) $9x + 6y = 141$
$2x + 3y = 43$

b) $y = 6x - 5$
$4x - 2y = 42$

c) $6x + 4y - 5z = 15$
$2x - y + 3z = -9$
$8x + 5y - 7z = 17$

3. Use these functions: $f(x) = 2x + 6$ $g(x) = x - 1$ $h(x) = x^2 - 3x$

a) Find $f(h(-5))$

b) Find $h(g(x))$

From Chapter 5   1. Write the equation of this parabola in Vertex Form: $y = a(x - h)^2 + k$

(-4,10)

(-2,-2)

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. Show the factored form then find the solutions.

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 equation below models the height of the object as a function of time. $h(t) = -16t^2 + 200e + 30$

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 this product: $(2 + 4i)(5 - 3i)$

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Chapter 6 1. Find all real and imaginary solutions.

a) $x^4 - 2x^2 - 24 = 0$ b) $x^3 - 5x^2 + 8x - 40 = 0$

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

a) $5x^3 - 3x^2 + x^5 - 9x + 12$ b) $-10x^4(5x + 6)(2x - 1)^2(x + 3)$
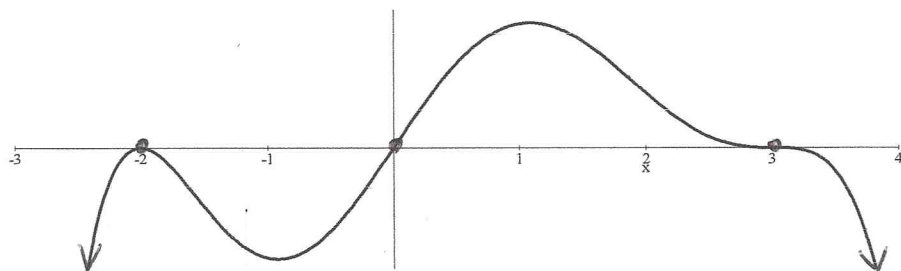
3. State the end behavior of each polynomial.

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. Name each polynomial by its DEGREE a) $4x - 8$ b) $6x^2 + x - 1$ c) 12 d) $9x^3 + 7x$

6. Name each polynomial by the NUMBER OF TERMS a) $x^6 - 3x^4 + x^2$ b) $8x^3$ c) $-\frac{2}{3}x + 1$

Chapter 9

1. Q varies directly with the cube of M and with G but inversely with the square of A.
$Q = 168.75$ when $M = 10$, $A = 4$, and $G = 6$. Find G when $Q = 500$, $M = 2$, and $A = 9$

2. Simplify. State restrictions on the variable. $\dfrac{2x^4 - 72x^2}{x^2 - 8x + 12} \cdot \dfrac{x^2 + 2x - 8}{4x^3 + 44x^2 + 120x}$

3. Simplify. Do not state restrictions on the variable. $\dfrac{4x}{x^2 - 25} + \dfrac{3}{x^2 - 7x + 10}$

4. Find all points of discontinuity and state if they are holes or vertical asymptotes. $y = \dfrac{x^2 - 16}{x^2 - x - 12}$
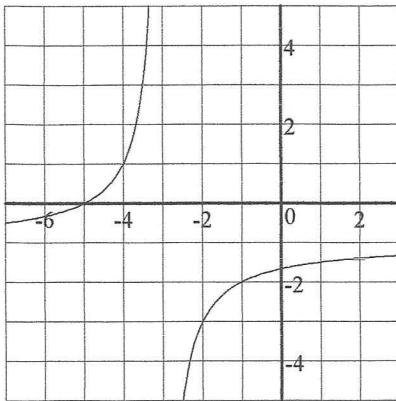
5. Write the equation of the Horizontal Asymptote, if any.

a) $y = \dfrac{6x^2 + 10x - 3}{2x^2 - 5x + 1}$ b) $y = \dfrac{14x + 3}{7x^2 - 4x - 5}$ c) $y = \dfrac{8x^3 + 9x - 4}{2x^2 + 3x + 4}$

6. Write the equation of this graph which is a transformation of $y = \frac{2}{x}$

7. Solve each rational equation.

a) $\dfrac{5}{x+3} = \dfrac{2x}{x^2+5x+6} + \dfrac{7}{x+2}$

b) $\dfrac{2x^2-6x-18}{x^2+3x+2} + \dfrac{4}{x+1} = \dfrac{x}{x+2}$