Algebra 2: Rational Expressions and Equations
Group A

1. There are 20 questions in this test:
    a. The first 10 questions are worth 3 points each. These relate directly to the present chapter, and are expected to take more time per question.
    b. The second 10 questions are worth 1 point each. Most of these are related to subjects we covered during the semester.
2. Extra-credit: There is one extra-credit question, worth 1pt. It is a harder question.
3. You have 50 minutes (one Block) to complete the test (more if you have accommodations).

You are allowed to use calculator.

Good luck!!
-Zachi

Group A

=== Start of test

1) Simplify. Remember to note excluded values.

$$\frac{(x^2+8x+12)}{(x^2+5x+6)} \cdot \frac{(x+3)^2}{(x+6)}$$

2) Simplify. Remember to note excluded values.

$$\frac{x^2-9}{(2+x)} \div \frac{x^2-3x}{(10+5x)}$$

3) Simplify. Remember to note excluded values.

$$\frac{3}{x-3} - \frac{5}{x-5}$$

4) Simplify. NO need to note excluded values.

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

5) Solve.

$$\frac{8(x+2)}{x^2-4} = \frac{2x}{(x-2)}$$

6) Solve.

$$\frac{4}{2y} - \frac{3}{4y} = \frac{1}{8y} + \frac{1}{8}$$

7) Divide using long division.

$(6x^4 + 5x^3 + 3x^2 - 3x - 2) \div (3x - 2)$

8) Divide using long division.

$(10x^4 + 4x^3 + 5x^2 - 3x + 2) \div (5x + 2)$

9) Divide using synthetic division.

$(3a^4 + 8a^3 + 3a^2 + 3a + 12) \div (a + 2)$

10) Divide using synthetic division.

$(3x^4 - 28x^2 + 8x - 15) \div (x - 3)$

Group A

==== Review questions!!

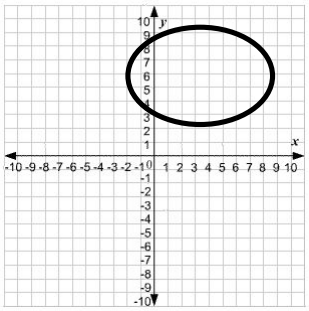
11) Solve:

$$2(1 + 6r) = r - 9$$

12) Check, using 'plug-in' (substituting back) your answer to 11:

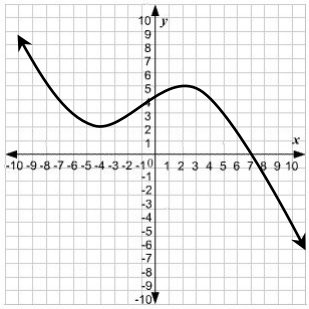
13) For each of the following, find the most specific name from "Relation", "Function", or "1-1 function"

a)



I) Relation II) Function III) 1-to-1 function

b)



I) Relation II) Function III) 1-to-1 function

14) Let $f(x) = \frac{x}{2} + 5$, and $g(x) = 2x + 6$.

a) Write $f(g(x))$?

b) Write $g(f(x))$?

15) Given the line $2y = \frac{x}{2} + 4$.

a) What is the slope of the line?

b) Write the equation of a parallel line going through the point (0,0)

16) Solve the system of equations:

$$\begin{cases} 2x - 3y = 1 \\ 2x + 3y = 7 \end{cases}$$

17) Solve

$x^2 + 2x = 8$

18) Simplify and express using only positive exponents

$$\frac{x^2(x^{-1})^2}{2^2}\ x$$

19) Simplify and express using only positive exponents

$$\left(\frac{-3x^3y^{-3}}{y^2 \cdot 9}\right)^3$$

20) Simplify. Remember to note excluded values.

$$\frac{1-\frac{1}{x}}{1-\left(\frac{2}{x+1}\right)}$$

Hint 1: Start by writing $1-\frac{1}{x}$ with common denominator

Hint 2: then write $1-\left(\frac{2}{x+1}\right)$ with common denominator

Then, divide (a/b) divide by (c/d):

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Extra-credit

21) if $ab=2$ and $(a-b)^2=10$, then what is the value of a^2+b^2 ?

=== End of test