Name: _____
Block: _____

Algebra 2H: Rational Expressions and Equations
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

=== Start of test

1) Simplify. Remember to note excluded values.

$$\frac{x^2+x-6}{x^2+6x+9} \cdot \frac{(x+4)^2}{x^2+2x-8}$$

2) Simplify. Remember to note excluded values.

$$\frac{x^2-36}{x^2-8x+16} \div \frac{3x-18}{x^2-x-12}$$

3) Simplify. Remember to note excluded values.

$$\frac{2x-10}{x^2-25} - \frac{5-x}{25-x^2}$$

4) Simplify. Remember to note excluded values.

$$\frac{x^3-8}{x^2-4x+4} - \frac{x^3+3x^2}{x^2+x-6} - \frac{8}{x-2}$$

(One more free question to practice complex fractions)
Simplify. Remember to note excluded values.

$$\frac{1+\frac{1}{x}}{1-\left(\frac{1}{2x+3}\right)}$$

5) Solve.

$$\frac{x^2-25}{x^2+10x+25} = \frac{-4}{6x}$$

6) Solve.

$$\frac{2x+3}{x-1} = \frac{10}{x^2-1} + \frac{2x-3}{x+1}$$

7) Divide using long division.

$$(6x^4 - x^3 - 21x^2 + 7x + 5) \div (3x - 5)$$

8) Divide using long division.

$$(6x^4 + 15x^3 + 4x^2 + 12x + 5) \div (2x + 5)$$

9) Divide using synthetic division.

$$(a^4 + 6a^3 + 13a^2 + 21a + 4) \div (a + 4)$$

10) Divide using synthetic division.

$$(6x^4 + 2x^2 - 104) \div (x + 2)$$

11) Question 11-20 (simple ones!) are on the following subjects. You do have all the quizzes and tests we have done this year to help you with practice questions. PLEASE make sure you are familiar with all of the terms below.

a. Sequence, Series: Arithmetic, Geometric, $\sum$ notation, sum of arithmetic series

Specifically: Make sure you know to do something like:

$$\sum_{n=1}^{20} (5n + 1) \; = \; ?$$

b. Lines: Through a point, through two points, slope, perpendicular, parallel

c. Relations, Functions, 1-1 Function. Function composition.

d. System of equations: Substitution, elimination, consistent, inconsistent.

e. Polynomial equations (e.g., : $m^2 = 4m$)

f. Rational expressions (really simple ones, as we have the main one in questions 1-10: Divide by monomial for example or complex rational expressions).

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Extra-credit

21) Find $m^4 + \frac{1}{m^4}$ if $m + \frac{1}{m} = 3$.

=== End of test