Bronx High School of Science
Valerie Reidy, Principal
02 November 2005

Mathematics Department
Harry Rattien, A. P. Mathematics
Mr. Shahom, Math Teacher

Name: _____ **M$5 Exam 3 PRACTICE**

1. Simplify: $\dfrac{1-\frac{3}{y}+\frac{2}{y^2}}{1-\frac{5}{y}+\frac{6}{y^2}}$

2. Simplify: $\dfrac{2y^2+11y+5}{4y^2+4y+1} \div \dfrac{2y^3+10y^2}{4y^3}$

3. Solve and check: $\dfrac{10}{k^2}+\dfrac{2}{k}=-\dfrac{1}{10}$

4. What is the product of $5+\sqrt{-36}$ and $1-\sqrt{-49}$ expressed in simplest $a+bi$ form?
   (1) $-37+41i$ (3) $47+41i$
   (3) $5-71i$ (4) $47-29i$

5. Solve for x and express the roots in simplest $a+bi$ form: $x+\frac{5}{x}=2$

6. Simplify and express in terms of i: $\dfrac{\sqrt{-36}}{-\sqrt{36}}$

7. State the conjugate of the complex number $\frac{\sqrt{2}}{2}-\frac{1}{2}i$: _____

8. Express the multiplicative inverse of your answer to number 7 in $a+bi$ form.

9. If $(3b-2ai)-(2+2ai)=7-4i$, find the values of a and b.

10. Express in $a+bi$ form: $\left(1-\sqrt{-9}\right)\left(2-\sqrt{-1}\right)$

11. Solve for all values of q that satisfy the equation $\sqrt{3q+7}=q+3$.

12. Solve and graph the solution set of $x^2-9x+8\le 0$

13. Express in simplest $a+bi$ form: $(i^3-1)(i^3+1)$.

14. Express in simplest radical form: $-4\sqrt[3]{54a^6b^4}$

15. Solve and graph the solution set on a number line: $|3y-4|<y$

16. Find the smallest integral value of x for which the radical represents a real number:
    $\sqrt{3x-14}$

17. Every real number is also:
    (1) complex (3) pure imaginary
    (2) imaginary (4) rational

18. The roots of the equation $x^2-8x=8(x-8)$ are
    (1) rational and equal (3) irrational and equal
    (2) irrational and unequal (4) rational and unequal

19. For what values of p are the roots of the equation $2x^2-x-p=0$ imaginary?

20. Find all values of n such that the roots of the equation $2x^2-x-8p=0$ are equal.