



# Brooklyn Technical High School

*“for engineering, mathematics, science, computers, and technology”*

Mr. Randy J. Asher, Principal

Dear Future Brooklyn Technical High School Students and their Families:

Congratulations on your acceptance to our prestigious school! For over 80 years, the staff at Brooklyn Technical High School (“Tech”) has provided a quality education for all our students.

The members of the Mathematics and Computer Science Department, similarly, endeavor to bring you both a strong traditional curriculum in mathematics as well as a contemporary curriculum rich in the use of new technology and instrumentation.

You will have many questions both before and after your orientation at Tech. A preview of some of the issues may serve to alleviate your anxiety.

## ***1) Previous mathematics courses and placement-***

At Brooklyn Technical High School students will take a four-year sequence in Mathematics. In the 9<sup>th</sup> grade you take a full year course in Algebra; in the 10<sup>th</sup> year you take a full year course in Geometry; in the 11<sup>th</sup> year you take a full year course in Pre-Calculus; in the 12<sup>th</sup> year you choose a mathematics course which can include AP Calculus. This annualization of curriculum affords us the opportunity to bring you a comprehensive and complete presentation of material necessary for an excellent mathematics education.

Students who place directly into Geometry in ninth grade may be able to take further advanced courses. The details concerning our accelerated credit policy and class placement are explained below:

### **\*\*Accelerated Credit Policy**

*Students starting acceleration at the beginning of grade 7* who passed required courses and subsequently pass Math A in January of grade 8 earn **three** terms of credit. Those students who pass Math A in June or August of grade 8 earn **two** terms of credit.

*Students starting acceleration at the beginning of grade 7* who have passing grades for all courses and passed Math A and Math B by June of grade 8 will receive **four** terms of credit. Students who have passing grades for all courses, passed Math A in January of grade 8, continue further acceleration in grade 8, and subsequently pass Math B in June of grade 9, will receive **six** terms of credit total (two for grade 7, two for grade 8 and two for grade 9).

Students starting acceleration at the beginning of grade 8 who passed the course and subsequently passed Math A in June or August of grade 8 earn **two** terms of credit. Those students who pass Math A in January of grade 9 earn **three** terms of credit. Those students who pass in June or August of grade 9 earn **two** terms of credit unless also passing Math B by June of grade 10 at which time they will be given **six** terms of credit total (two for grade 8, two for grade 9 and two for grade 10).

Students starting acceleration at the beginning of grade 8 who passed the course and subsequently passed Integrated Algebra in June or August of grade 8 will earn two terms of credit.

### **\*\*Class Placement**

Students earning an **85 or better** on the Integrated Algebra Regents or Math A Regents **will automatically be placed in Geometry I.**

Students who pass the Regents and do not score greater than 85 will earn the credit but be placed into Algebra I at Brooklyn Tech to help build a strong foundation before being placed in advanced math classes.

### **II) Calculators-**

In order to insure that each entering student is prepared to use technology in the mathematics classroom, it is highly recommended that every incoming student purchase a TI83+ calculator. (Although other manufacturers produce calculators of similar quality, we have used these calculators successfully for many years.) This is one of many graphing calculators that may be used on the Mathematics A/B Regents. Likewise, it can be used on the new Mathematics Regents courses beginning in June 2008. In fact, solutions for many questions will require the use of the graphing calculator.

If students acquire the TI83+ calculator upon their arrival at our school they

- a) can receive instruction in the use of their own calculator from the beginning of school experience
- b) can be the beneficiaries of instruction involving technology in the classroom
- c) can become comfortable with the particular “feel” of their own calculator
- d) can insure availability of a calculator for both classwork and homework
- e) can download application software which allow them to do sophisticated mathematical problems
- f) can upload/download information between their calculators and home computers
- g) can use their calculators in other courses (e.g., science, psychology, etc.) in which the power of the graphing calculators can provide additional abilities for student success

### **III) Math Programs-**

In addition to the four-year course work described above, the Mathematics and Computer Science Department supports two majors (of many) that students choose at the end of their sophomore year. The Math major presents an opportunity for a concentration in mathematics study, including mathematics problem solving, math research, a course in discrete mathematics, and an advanced

placement courses in Calculus (BC). The Computer Science Major presents an opportunity for a concentration in software and hardware including JAVA, web and database designs and practical courses in computer networking, operating systems and hardware maintenance.

Tech has also been a supporter of Math Teams for over 50 years. We currently participate in competitions in New York City, New York State and regional contests. During the past few years, we have won many competitions both on an individual and team basis. We have also had many students asked to participate in the prestigious American Invitational Mathematics Examination sponsored by the Mathematics Association of America. We welcome all incoming ninth graders to try out for the freshman team(s). Applications are available at the orientation and on line. Please find enclosed a list of challenging problems. Those interested in joining our team(s) should complete the application and solutions to the problems and bring these with them to the orientation or mail them by June 6, 2008 to:

Math Department / Math Team  
Brooklyn Technical H.S., Attn: J. Kaelin  
29 Ft. Greene Place, Brooklyn, New York 11217

I'm sure you have many other questions about programs and activities that we have at Tech. We welcome you to visit our website at [www.bths.edu](http://www.bths.edu) and read these and other aspects of life at BTHS. Feel free to contact me with any questions. Write to [JKaelin@schools.nyc.gov](mailto:JKaelin@schools.nyc.gov) or call me at 718-804-6580.

Good luck!!

Joe Kaelin  
AP Mathematics



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Department of Mathematics & Computer Science

## ***BTHS Math Team Application Form for Incoming Students Fall 2008***

Please Print Clearly                      \*E-mail address\* \_\_\_\_\_

Last Name \_\_\_\_\_ First Name \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_ Zip \_\_\_\_\_

Home Telephone (    ) \_\_\_\_\_ - \_\_\_\_\_                      OSIS # if known \_\_\_\_\_

Your School \_\_\_\_\_ Borough \_\_\_\_\_

New York State Examinations in Mathematics you have taken, and scores

Math A \_\_\_\_\_ Math B \_\_\_\_\_ None \_\_\_\_\_

Current Math Class \_\_\_\_\_ Grade in class \_\_\_\_\_ % or A B C D F (circle one)

Math Classes taken outside of school (colleges, NSF, etc.)

Name of Program \_\_\_\_\_ Location \_\_\_\_\_ Grade \_\_\_\_\_

Have you ever been a member of a Math Team? Yes \_\_\_\_\_ No \_\_\_\_\_

Did you participate in any of the following competitions?

AMC 8    Score \_\_\_\_\_                      AMC 10    Score \_\_\_\_\_                      Other (name) \_\_\_\_\_ Score \_\_\_\_\_

Did you or your team receive any awards? Yes \_\_\_\_\_ No \_\_\_\_\_ (Check one)

If yes, please describe briefly (Such as "First Place" or "Individual High Score", etc.)

**We may offer a special training session for incoming students this summer. This would most likely be during a week in middle to late August. Would you be able to attend?**

Yes \_\_\_\_\_ No \_\_\_\_\_ (Check one).

If not, are there other possible weeks for you to join us this summer? \_\_\_\_\_

Mail this form with you solutions to → →  
\*(We will communicate with you via e-mail)\*

**(Be sure to include the words "Math Team")**

Math Department/Math Team

Brooklyn Technical High School

29 Fort Greene Place

Brooklyn, NY 11217

## **FOR INCOMING STUDENTS WHO ARE INTERESTED IN OUR MATH TEAMS**

Try any or all of the following problems at your leisure. Some of the problems you may find to be rather easy, while others may challenge you. Please write your solutions on a separate page or pages. Keep this problem sheet for reference. In addition to your answers, we are very interested to see how you arrived at your answer. Please write neatly and be sure to put your name on any pages you submit.

1. Compute without using a calculator:  $(987654321)(987654321) - (987654323)(987654319)$ .
2. Find the smaller angle formed by the hands of a clock at 12:25.
3. How many positive integer divisors has 144?
4. A car travels from A to B at 20 mph and returns over the same route at 60 mph. What is the average rate for the round trip if the distance from A to B is 15 miles?
5. A 25-foot ladder leans against a vertical wall. The foot of the ladder is 7 feet from the base of the wall. If the top of the ladder slips 4 feet down the wall, how far will the foot of the ladder slide?
6. Two sides of an isosceles triangle are 8 and 17. Compute its perimeter.
7. If the diagonal of a square is 6, what is the area of the square?
8. Find the volume of a rectangular solid if the areas of three of its adjacent faces are 12, 8 and 6.
9. If  $m$  women can do a job in  $d$  days, how long will it take  $w$  women working at the same rate to do the same job.
10. Find the 100<sup>th</sup> place to the right of the decimal point in the decimal expansion of  $1/13$ .
11. What is the units digit of  $7^{42}$  ?
12. Find the 100<sup>th</sup> term in the sequence 77, 71, 65, 59,....
13. Find the sum of the roots of the equation  $4x^2 + 5 - 8x = 0$ .
14. If 713512A1 is divisible by 3, find all possible values of the missing digit A.
15. In triangle ABC,  $AC=BC$ . The point D is on BC such that  $AB=AD=DC$ .  
Compute the measure of angle C.
16. Joan's stamp collection consists of three books. Two tenths of her stamps are on the first book, several sevenths are in the second, and there are 303 stamps in the third book. How many stamps are there in Joan's collection?
17. Solve for all real values of  $x$  if  $9^{x+2} = 240 + 9^x$
18. A circle of radius 2 is externally tangent to a circle of radius 8. Compute the length of their common tangent.
19. Compute the value of the sum of the reciprocals of the roots of the equation  $x^2 + 7x + 11 = 0$
20. Two swimmers at opposite ends of a ninety-foot pool start to swim the length of the pool, one at 3 feet per second and the other at 2 feet per second. If they swim back and forth for twelve minutes, how many times do they pass each other?