The Problem Solver

Mathematical Problem–Solving Newsletter for High School Students and Teachers

MATH CONCEPTS CHECK-UP BEFORE SBAC TESTING

This is a good time to take a look at the working knowledge students in grades 6–8 and 11 have with respect to number sense, pre–algebra, and algebra (including algebra 2). The **FREE** online MDTP (Math Diagnostic Testing Project) tests will provide feedback to teachers, students, and parents.

With the Smarter Balanced Assessment Consortium (SBAC) tests soon to be administered state-wide, the MDTP test results will give teachers time to "plug some holes" in terms of students' misconceptions of algebraic, statistical, or probability topics.

MDTP tests are available for grade levels 6–12 ([see here for choices](#)). Call (657) 278-7248 or email mdtp@fullerton.edu to get help with setting up your classes to take the MDTP test for a specific grade level or math course.

OPPORTUNITY FOR HIGHLY TALENTED MATH STUDENT(S)

If you have students for whom the content is trivial and are seeking to be challenged mathematically, consider nominating them to attend the Fullerton Mathematics Circle. Under the guidance of internationally recognized mathematician, Dr. Bogdan Suceava, colleague Dr. Shoo Seto, and CSU Fullerton mathematics majors, middle and high school students tackle mind-stretching math problems designed to expand their knowledge of algebra, number theory, and geometry. The Circle meets on Saturdays, once a month at CSUF. Here are the dates it will be offered this Spring: March 16, 23, and April 27.

Please contact Dr. Shoo Seto for more information: shoseto@fullerton.edu.

PROBLEM TO SOLVE

Order these numbers from smallest to largest using properties of exponents and mental methods. Show your reasoning.

$$3^{22} \qquad 4^{14} \qquad 9^{10} \qquad 8^{10}$$

SOLUTION

$$9^{10} = (3^2)^{10} = 3^{20}$$
$$4^{14} = (2^2)^{14} = 2^{28}$$
$$8^{10} = (2^3)^{10} = 2^{30}$$

Now, $8^{10} < 9^{10} = 3^{20} < 3^{22}$, and $4^{14} = 2^{28} < 2^{30} = 8^{10}$, so we have the order from smallest to largest as,

$$4^{14} < 8^{10} < 9^{10} < 3^{22}.$$