

Name: \_\_\_\_\_

## Exponent-Related Contest Problems

Math League 2005

14. Of the following, which has the largest value?

- A) 7      B)  $(-1)^2$       C)  $(-2)^2$       D)  $(-3)^2$

Math League 2005

29.  $2^{10} \times 2^{10} =$

- A)  $2^{20}$       B)  $2^{100}$       C)  $4^{20}$       D)  $4^{100}$

Math League 2005

31.  $\sqrt{16^{16}} =$

- A)  $4^4$       B)  $4^8$       C)  $16^4$       D)  $16^8$

Math League 2005

32. Each of 2005 fractions has an even numerator and an odd denominator. If the product of all of them is an integer, it must be

- A) Even      B) Odd      C) Prime      D) 2005

Math League 2005

34. When fully expanded,  $10,000^{9999}$  has \_\_\_?\_\_\_ digits.

- A) 9999      B) 10,000      C) 39,996      D) 39,997

Math League 2005

36. If the sum of 2000 consecutive integers is 1000, then the sum of the digits of the *greatest* of these 2000 integers is

- A) 1      B) 2      C) 9      D) 27

Math League 2005

37. How many of the 15 positive factors of 400 are divisible by 4?

- A) 4            B) 8            C) 9            D) 10

Math League 2005

40. What is the tens' digit of the product  $1 \times 2 \times 3 \times \dots \times 98 \times 99$  ?

- A) 4            B) 6            C) 8            D) 0

Math League 2013

16.  $2^2 \times 2^2 \times 2^2 + 2^2 \times 2^2 + 2^2 = 2^2 \times \_? \_$

- A) 16            B) 21            C) 32            D) 33

Math League 2013

28. How many of the first 1000 positive integers are multiples of both 4 and 5 but not of 6?

- A) 34            B) 42            C) 50            D) 58

Math League 2013

32. What is the greatest prime factor of  $9^{18} - 3^{32}$  ?

- A) 5            B) 17            C) 19            D) 31

Math League 2013

33. How many factors of  $3 \times 6 \times 9 \times 12 \times 15 \times 18$  are greater than 1 and are the square of an integer?

- A) 15            B) 14            C) 7            D) 6