

# Fourteenth Annual PI Competition

## Math I Team Test



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### Math I Team Problem 1

Let  $L$  = the 5th prime number

Let  $G$  = the number of prime numbers from 1 to 25

Let  $D$  = the largest prime number from 1 to 100

Let  $O$  = the product of the 3rd prime number and the 7th prime number

What is  $G + O + L + D$

### **Math I Team Problem 2**

There are 40 marbles in a bag. 10 of them are green, 20 of them are red, 4 of them are yellow, and 6 of them are blue.

Let  $F$  = the probability of drawing a red marble

Let  $C$  = the probability of drawing a green marble

Let  $L$  = the probability of drawing a yellow marble

Let  $A$  = the probability of drawing a blue marble

What is  $C \times A \times L \div F$ ? Express your answer as a fraction in simplest form.

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### **Math I Team Problem 3**

Let  $Y$  = the sum of all positive divisors of 16

Let  $L$  = the least common multiple of 9 and 12

Let  $A$  = the greatest common divisor of 264 and 33

Let  $P$  = the product of the first 5 positive integers

What is  $P + L - A + Y$

### Math I Team Problem 4

I am 17 years old. 3 years ago, I was a third of my mom's age.

Let  $E$  = my mom's current age

Let  $G$  = the sum of my current age and my mom's current age

Let  $M$  = the number of years it will take for me to be as old as the average of my age and my mom's current age

Let  $A$  = the difference in my and my mom's age 3 years ago

What is  $G + A \div M - E$

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### Math I Team Problem 5

Bobby is using a system with the alphabet and numbers such that  $A=1$ ,  $B=2$ ,  $C=3$ , and so on. With this information, solve:  $P+E(N-S)+A(C+O)+L/A$

### **Math I Team Problem 6**

Let  $T$  = the remainder when 2023 is divided by 12

Let  $M$  = the remainder when 2023 is divided by 18

Let  $I$  = the remainder when 2023 is divided by 3

Let  $E$  = the remainder when 2023 is divided by 11

What is  $T \times I \times M \times E$

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### **Math I Team Problem 7**

Consider the sequence 2, 4, 8, 16...

Let  $S$  = the product of the first 3 terms

Let  $I$  = the value of the 8th term in the sequence

Let  $F$  = the sum of the 5th and 6th terms in the sequence

Let  $H$  = the quotient of the 6th term and the 4th term

What is  $F + I + S + H$

### Math I Team Problem 8

90 students were given a test. 10% of them got an A, 30% of them got a B, 20% of them got a C, and 40% of them got a D.

Let  $F$  = the ratio of the students who got an A to those who got a B

Let  $I$  = the ratio of the students who got a B to those who got a D

Let  $L$  = the ratio of the students who got a C to those who got an A

Let  $A$  = the ratio of the students who got an A to all the students

What is  $F \times A \times I \times L$ ? Express your answer as a fraction in simplest form.

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### Math I Team Problem 9

Ben has a big bag of candy, but his friends are very mean and decide to steal some.

Megan steals  $\frac{1}{3}$  of the candy, Kaylee takes  $\frac{1}{4}$  of the remaining candy, and Kathryn takes  $\frac{1}{2}$  of the rest of the candy. This leaves Ben with 15 pieces of candy.

Let  $O$  = the amount of candy Megan took

Let  $Z$  = the amount of candy Kathryn took

Let  $E$  = the amount of candy Ben started with

Let  $R$  = the amount of candy Kaylee took

What is  $Z + E + R + O$

### **Math I Team Problem 10**

Find the value of T that makes this true: T% of 300 is 60.

Find the value of A that makes this true: 20% of 150 is A.

Find the value of M that makes this true: 15% of M is 15.

Find the value of H that makes this true: 100% of 200% of 3 is H.

What is  $MA - TH$

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