

**2004 All-Day Sprint: Polymath**  
**School Code: \_\_\_\_\_ School Name: \_\_\_\_\_**

This Sprint should be completed by students without any adult assistance. Only one answer form should be turned in by each school. This is just a worksheet on which you can scribble while you work out the answers. Be sure to turn in the YELLOW answer sheet before 2:00 in the box in room 208 Maybank.

1. The novel *The Time Machine* had an opening chapter that discusses the mathematics of higher dimensional spaces and was recently remade as a movie. If the book's author was named Wells then write the first letter of the author's first name in box 5. If his name was Welles then write the first letter of the author's middle name in box 5.
2. If the College of Charleston is a *public* university, write a capital letter I in box number 6. If it is a *private* school, write a capital letter I in box number 2.
3. The tympani, viola, cello and harpsicord are all musical instruments. Pick the one which is *smallest* and write the first letter of its name in box number 7.
4. Write the number of US Presidents assassinated *before* 1960 in box number 1.
5. Put the mathematical symbol for "perpendicular" in box number 3.
6. One letter in the standard English alphabet evolved from the union of two vowels, as its name attests. Put one of these letters in box number 4.
7. If Concord is the capital of New Hampshire, exchange the contents of box number 1 and box number 3.
8. If Texas has the largest area of any of the fifty states, exchange the contents of box number 3 and box number 4.
9. The Statue of Liberty was a gift to the United States from a foreign country. If it was a gift from Liberia, copy the contents of box number 1 into box number 8. If it was a gift from England, copy the contents of box number 3 into box number 8. If it was a gift from France, copy the contents of box number 4 into box number 8. If it was a gift from Australia, stand on your head and sing the theme song to your favorite TV show.
10. If, for all numbers  $\theta$ , it is true that  $\sin^2 \theta$  is one more than  $\cos^2 \theta$ , exchange the contents of box number 4 and box number 5.
11. If the number 22 can be written as a sum of two prime numbers, erase the *top* bar from the letter I that you wrote for question 2. If it cannot, erase the *bottom* bar from the letter I you wrote for question 2.
12. Write the largest prime factor of the number 729 in the only remaining empty box.
13. What is the *color* of the royal family of the Netherlands? If it is *blue* then put a vertical line through the middle of box number 7. If it is *pink* then put a vertical line through the middle of box number 2. If it is *orange* then put a horizontal line through the middle of box number 7. If it is *green* then put a horizontal line through the middle of box number 2.

1     2     3     4     5     6     7     8

## Answers

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- The novel *The Time Machine* had an opening chapter that discusses the mathematics of higher dimensional spaces and was recently remade as a movie. If the book's author was named Wells then write the first letter of the author's first name in box 5. If his name was Welles then write the first letter of the author's middle name in box 5.  
H.G. Wells (put an H in box 5.)
  - If the College of Charleston is a *public* university, write a capital letter I in box number 6. If it is a *private* school, write a capital letter I in box number 2.  
The College of Charleston is a public university. (Write an I in box 6.)
  - The tympani, viola, cello and harpsicord are all musical instruments. Pick the one which is *smallest* and write the first letter of its name in box number 7.  
The viola is smaller than any of these other instruments. Put a v in box 7.
  - Write the number of US Presidents assassinated *before* 1960 in box number 1.  
There were 3 US presidents assassinated before 1960 (Lincoln, Garfield and McKinley). Put a 3 in box 1.
  - Put the mathematical symbol for "perpendicular" in box number 3.  
That symbol ( $\perp$ ) looks like an upside-down letter T.
  - One letter in the standard English alphabet evolved from the union of two vowels, as its name attests. Put one of these letters in box number 4.  
If you look at Roman writing, the letter "U" was written more like a "V". A "double U" (such as in the word "vacuum") literally became our letter W...so put one in box 4.
  - If Concord is the capital of New Hampshire, exchange the contents of box number 1 and box number 3.  
Yes, it is. Exchange.
  - If Texas has the largest area of any of the fifty states, exchange the contents of box number 3 and box number 4.  
No, Alaska is larger...don't exchange.
  - The Statue of Liberty was a gift to the United States from a foreign country. If it was a gift from Liberia, copy the contents of box number 1 into box number 8. If it was a gift from England, copy the contents of box number 3 into box number 8. If it was a gift from France, copy the contents of box number 4 into box number 8. If it was a gift from Australia, stand on your head and sing the theme song to your favorite TV show.  
France gave us the Statue of Liberty. Copy box 4 into box 8.
  - If, for all numbers  $\theta$ , it is true that  $\sin^2 \theta$  is one more than  $\cos^2 \theta$ , exchange the contents of box number 4 and box number 5.  
Although there is a relationship between sine, cosine and the number 1, this is not it. (For instance, this would imply that  $\sin^2 0 = 2$ !)
  - If the number 22 can be written as a sum of two prime numbers, erase the *top* bar from the letter I that you wrote for question 2. If it cannot, erase the *bottom* bar from the letter I you wrote for question 2.  
Not only can we write  $22 = 19 + 3$  as a sum of two primes, as far as we know, this can be done for *any* positive even number. It is a famous open conjecture known as Goldbach's Conjecture and proving it one way or another could win you a million dollar prize as well as fame as a great mathematician!
  - Write the largest prime factor of the number 729 in the only remaining empty box.  
The *only* prime factor of 729 is 3.
  - What is the *color* of the royal family of the Netherlands? If it is *blue* then put a vertical line through the middle of box number 7. If it is *pink* then put a vertical line through the middle of box number 2. If it is *orange* then put a horizontal line through the middle of box number 7. If it is *green* then put a horizontal line through the middle of box number 2.  
The Dutch royal family is *orange*, like their famous ancestor William of Orange.
- When you answer everything correctly, you should end up with symbols in the boxes that spell out "MATH MEET" when viewed upside-down!**