



Knights of Pi Math Tournament – Dec. 12, 2009

Joust!

## DETERMINATION

Memorize the digits of  $\pi$  and  $e$ . For every 5 digits after the decimal place memorized, your team receives 1 point. You may receive up to 5 points for  $\pi$  and up to 5 points for  $e$ . In order to get the points, recite the digits to a proctor. If you get a digit wrong, you lose the points for any subsequent digits on that attempt. You may make an unlimited number of attempts.

$$\pi = 3.$$

14159

26535

89793

23846

26433

$$e = 2.$$

71828

18284

59045

23536

02874



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School Name \_\_\_\_\_

Team Number \_\_\_\_\_

Team Grade \_\_\_\_\_

Team Member Names \_\_\_\_\_

## WIT

This question is worth 10 points. When you have your answer, give your answer and team number to your proctor. You only get one chance at this question. If you get this question wrong, you get 0 points.

<b>8</b>	<b>5</b>	<b>4</b>	<b>9</b>	<b>1</b>	<b>7</b>	<b>6</b>	<b>10</b>	<b>2</b>
MATHEMATICS								

Oscar Callaghan Davidson has a very specific method of organizing his set of ten math books on a bookshelf. However, he carelessly left Volume 3 on the table. After which volume should Volume 3 be placed?

Circle One:

Volume 8	Volume 5	Volume 4	Volume 9
Volume 1	Volume 7	Volume 6	Volume 10
Volume 2	None – Volume 3 should be the first volume		

When finished, make sure you have filled out your team information at the top of the page and turn in this form to the proctor.



Place your answer here: \_\_\_\_\_ (2 points)

Problem 3

You start with a 3x3 table with 0 in all the cells, shown below. You are allowed to choose any 2x2 subtable and increase all the cells of that 2x2 subtable by 1. After performing some number of these operations, you end up with the table shown below on the right. What is the missing number?

0	0	0
0	0	0
0	0	0

1	4	3
7	14	?
6	10	4

Place your answer here: \_\_\_\_\_ (2 points)

Problem 4

On December 1, Kevin the Sushi-Eating Machine declares, "Today I will eat more sushi than two days ago but less sushi than seven days ago." What is the greatest number of days that he can make this statement (including December 1) and have it remain true?

Place your answer here: \_\_\_\_\_ (2 points)

Problem 5

Let A = your answer to problem 1, B = your answer to problem 2, C = your answer to problem 3, and D = your answer to problem 4. Find:  $3 \times A \times C \times D + B$

Place your answer here: \_\_\_\_\_ (2 points)



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## PRECISION

Simplify this expression. You may check with the proctor to see if your answer is correct. Your answer must be as simplified as the one on the answer key in order to receive 10 points. Otherwise, you receive 0 points. You may make an unlimited number of attempts.

$$\frac{\frac{303}{303} \times (3 - (2 + 357 \times 909909 \times 0 \times 10908)) \times ((-25 \times -5)y - 475y \div 5) \left(\frac{306x}{17} \div 3 - x(3 \times 3 - 2 \times 2)\right)}{(9699690 \div 3 \div 5 \div 7 \div 11 \div 13 \div 17 \div 19) \times (729 \div (3 \times 3 \times 3 \times 3 \times 3))} \times \frac{\left(\frac{\pi e}{e\pi}\right) \left(\left(-18 + 3 + \frac{-60}{-3}\right)x + 2 \times 2 \times 2x\right) \times \left(\frac{5 + 80 - 10 \div 2 + (70 - 3) - 5 \times 11 - 2 \times 6}{348636 - 106 \times 3289}x - 3 \times 13x\right)}{1}$$

Attempt 1 Answer: \_\_\_\_\_

Attempt 2 Answer: \_\_\_\_\_

Attempt 3 Answer: \_\_\_\_\_

Attempt 4 Answer: \_\_\_\_\_

Attempt 5 Answer: \_\_\_\_\_

Attempt 6 Answer: \_\_\_\_\_

Attempt 7 Answer: \_\_\_\_\_

Attempt 8 Answer: \_\_\_\_\_

Attempt 9 Answer: \_\_\_\_\_

Attempt 10 Answer: \_\_\_\_\_

(If you haven't gotten it by now, perhaps try a different station?)



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## VALOR

This round is worth 1 point per correct item, up to 10 points. Be quiet in the halls. Don't run in the halls. When you want to turn in your answers, go to the room number that is the answer to question 10 and give this page to one of the proctors there.

1. Go to room (2462 – 1354). Go to the nearest stairwell. Count the number of steps as you go up to the second floor. **Answer:** \_\_\_\_\_

2. How many elevators are there in the school building? **Answer:** \_\_\_\_\_

3. Go to the cafeteria. Count the number of cylindrical lights hanging from the ceiling. **Answer:** \_\_\_\_\_

4. Go in front of, but not inside, room ( $2 \times 7 \times 79$ ). Look up. How many lights are there? **Answer:** \_\_\_\_\_

5. Go to locker C ( $98 + 21$ ). It's on the third floor. Look above it. There is a painting. Carefully count the total number of animals in the mural, including partial animals. **Answer:** \_\_\_\_\_

6. What subjects are taught in room ( $2 \times 2 \times 277$ )? **Answer:** \_\_\_\_\_

7. How many floors does Newport have in the academic wing (north end of the building)? **Answer:** \_\_\_\_\_

8. Count the number of lockers between rooms  $\frac{3312}{3}$  and ( $42 \times 31 - 194$ ). **Answer:** \_\_\_\_\_

9. Go to the math club trophy case. Look at the bottom level. Add up all the places on all the trophies and plaques. **Answer:** \_\_\_\_\_

10. Multiply the answers from questions 8 and 9. Divide the result by the answer to question 4. Add 34. This is the room number where the hidden Joust round #6 is located.

**Turn in this page in room ... Answer:** \_\_\_\_\_



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### ARDOR

There are 10 points at stake here. It could make the difference between first and second place, or between placing and not placing. Show how dedicated you are to scoring those points. You must do these in front of the proctors in this room. (Nice job finding it, by the way!) They'll give you the points as long as you do it and make a good effort.

Note: You can only score a maximum of 10 points, so **choose two items** from the list below to complete.

**Sing this song (5 points)** to any tune:

So I thought back: do calculus,  
Way back to Newton and to Leibniz  
And to problems just like this.  
And just like that when I had given up all hope  
I said nope.  
There's just one way to find that slope –  
And so now I, I will derive!  
Find the derivative of  $x$ 's position with respect to time.  
It's as easy as can be –  
Just have to take  $dx/dt$  –  
I will derive, I will derive, I will derive!

**Act out a scene (5 points)** from a play, movie, TV show, video game, etc. Before you begin, announce what you're going to act out. Include an element related to math.

**Tell a funny math joke (5 points)** that actually makes us laugh.

**Deliver a short speech (5 points)**, one to two minutes long, that explains why math is important and useful in our society or culture today.