Contest Corner: The 2015 OCTM State Tournament of Mathematics Results

Michael Flick and Debbie Kuchey, Xavier University

You have to go all the way back to 1875 to find cold weather that even comes close to matching what Ohio experienced in February of 2015. The morning of February 21 was especially cold and snowy in many parts of the state but the OCTM's 42nd Annual State Tournament of Mathematics still took place at many test centers throughout Ohio, as scheduled. The heavy snow and ice storm that hit parts of the state in the early morning of contest day forced several key test centers to cancel. The tournament has never had such inclement weather interfere with the competition since its inception 42 years ago.

A total of 760 students representing 68 schools braved the elements to compete. The overall results for the top 22 schools are summarized in Table 1.

Table 1. 2015 Overall OCTM State Tournament of Mathematics Results

Rank	School	Score
1	William Mason High School	146
2	Dublin Jerome High School	140
3	Western Reserve Academy School	134
4	Columbus Academy High School	123
5	Perrysburg High School	122
6	Dublin Coffman High School	121
7	Sycamore High School	120
	Westlake High School	120
9	Revere High School	117
10	Copley High School	113
11	Upper Arlington High School	107
12	Brecksville-Broadview Heights	106
13	Hilliard Darby High School	103
	Seven Hills Upper School	103
15	St Vincent-St Mary High School	102
16	Thomas Worthington High School	100
	Wellington School	100
18	Avon Lake High School	98
19	Hilliard Davidson High School	93
20	Archbishop Hoban High School	91
	Berea-Midpark High School	90
22	Hilliard Bradley High School	89

As has been done for many years, the OCTM also presented awards and recognition to participating schools by their size. In this way, small schools are not put in direct competition with larger schools. OCTM uses a five-level system to group schools:
- Level 1 schools have fewer than 91 students per grade level,
- Level 2 schools have between 91 and 162 students per grade level,
- Level 3 schools have between 162 and 289 students per grade level,
- Level 4 schools have between 289 and 414 students per grade level, and
- Level 5 schools have more than 414 students per grade level.

Table 2 shows the 2015 OCTM State Tournament results by level.

Table 2. Results by Level

2015 OCTM State Tournament Results

LEVEL 1	LEVEL 2	LEVEL 3
Level 1: (n ≤ 91)	Level 2: (91 < n ≤ 162)	Level 3: (162 < n ≤ 289)
1. 103 Seven Hills Upper	1. 134 Western Reserve	1. 117 Revere
2. 100 Wellington	2. 123 Columbus	2. 113 Copley
3. 79 Miami Valley	3. 102 St Vincent-St Mary	3. 98 Avon Lake
4. 76 Hathaway Brown	4. 84 Hawken Upper	4. 91 Archbishop Hoban
5. 63 Bluffton	5. 82 Kirtland	5. 86 Ashland
6. 62 Trinity	6. 80 Gilmour	86 Shawnee
7. 57 Lake Ridge	7. 63 Central Catholic	7. 78 Aurora
8. 53 Ayersville	8. 58 Cincinnati Hills Christian	8. 72 Celina
9. 52 Bio-Med Science	9. 44 Edison	9. 62 Athens
10. 47 Fort Jennings	10. 40 Black River	62 Lexington
11. 32 Cincinnati Country Day	11. 33 Purcell-Marian	11. 59 Perkins
12. 27 Delaware Christian	12. 20 Pleasant	12. 54 Poland Seminary
13. 23 Summit Country Day	13. 17 Saint Martin de Porres	13. 46 John Hay
		14. 22 Centennial

LEVEL 4	LEVEL 5
Level 4: (289 < n ≤ 414)	Level 5: (414 < n)
1. 140 Dublin Jerome	1. 146 William Mason
2. 122 Perrysburg	2. 121 Dublin Coffman
3. 120 Westlake	3. 120 Sycamore
4. 106 Brecksville-Broadview Heights	4. 107 Upper Arlington
5. 103 Hilliard Darby	5. 93 Hilliard Davidson
6. 100 Thomas Worthington	6. 90 Berea-Midpark
7. 89 Hilliard Bradley	7. 82 Lakota West
8. 88 Dublin Scioto	8. 80 Strongsville
9. 76 Mayfield	9. 61 Jackson
10. 71 Olmsted Falls	10. 46 Perry
11. 61 Loveland	11. 35 Beavercreek
12. 47 Sylvania Northview	12. 27 Solon
13. 25 Marysville	13. 19 East

Seven problems selected from the 40 that appeared on the 2015 tournament are shown in Table 3. All of the problems can be solved using principles of algebra, geometry, and arithmetic intermixed with strong problem solving skills. Calculators are always allowed on the OCTM tournament. Visit the contest website (www.octmtournament.org) for copies of previous contests as well as answers. Problems from these contests can be used with mathematics clubs or in math class to prepare "mathletes" for competition in 2016.

Table 3. A sampling from the 40 problems that appeared on the 2015 tournament

Questions	Answers
1. Determine the exact value of $2 + \frac{0}{1^5}$	2
2. The line $20x + 15y = 30$ is perpendicular to the line $y = 15 - \frac{k}{4}x$. Find the value of k.	$k = -3$
3. What is the exact measure in degrees of the acute angle between the hour and minute hands at 2:15 pm?	22.5°

4.	The arithmetic mean of the set $\{n + 20, n - 5, n - 20, n, n + 15\}$ is 15. What is the value of the median of the set?	13
5.	If $2^x = 15$ and $15^y = \frac{1}{32}$, determine the value of xy.	$xy = -5$
6.	Joyce Vogt's lawn has twice as much area as Anne Ramsey's lawn and three times as much as Marti Phelan's lawn. Marti's mower cuts half as fast as Anne's mower and one third as fast as Joyce's mower. If they all start to mow their own lawn at the same time, who is the ***first*** to finish? (A) Joyce (B) Anne (C) Marti (D) Joyce and Marti (E) all three	(B) Anne
7.	Bert Waits travels 120 miles toward Columbus, turns at an angle of *x* degrees, then travels 140 miles forward. If he is now 200 miles from where he started, find the angle *x* to the nearest degree.	80°

So, start assembling a team to represent your school in the 2016 tournament today. The 2016 tournament will take place on February 27, 2016 at test centers located throughout Ohio. You can find registration information on the OCTM State Tournament of Mathematics at www.octmtournament.org . One of the most important things we, as teachers, can do for our students is to make competition available. Competition helps build comradery, a lifelong interest in mathematics, and a desire to achieve while building self-esteem to succeed. The calendar of events for the 2016 tournament is shown below. We hope to see your school in February at the 2016 OCTM State Tournament of Mathematics!

September 15, 2015	Coaches Begin Sign-up
September 15, 2015	Student Tournament Registration Opens Online
October 1, 2015	Tournament Announcement Letter Mailed
February 5, 2016	Deadline for receiving Registration Fee without late fee. (no late fee, if postmarked by this date)
February 15, 2016	LAST Day for receiving Registration Fee - must include $25.00 late fee
February 15, 2016	Student Tournament Registration Closes - No Registrations accepted after this date.
February 23, 2016	Deadline for Coaches to Finalize Student List Online
February 27, 2016	Tournament Test Day held at 25 Ohio Sites

Michael Flick (flick@xavier.edu) has served the Ohio Council of Teachers of Mathematics as State Contest Coordinator for over 25 years. He has received numerous teaching awards and honors. Flick is a Professor, Director of the Center for Excellence in Education, and Chair of the Department of Secondary and Special Education at Xavier University.

Debora Kuchey (kuchey@xavier.edu,) served as a Teacher Leader in the Kentucky Middle Grades Mathematics Teacher Network for several years. She is currently the College Representative for the Greater Cincinnati Council of Teachers of Mathematics. Kuchey is an Associate Professor in Early and Middle Childhood Mathematics Education at Xavier University.