"Math is Cool" Championships – 2012-13

High School – October 19, 2012
Mental Math Contest

Mental Math – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

*When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. **You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.** Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

#	Problem
1	What is six cubed divided by two cubed?
2	If x equals 8 and y equals 12, what is 6 x plus 6 y?
3	What is the value of x if, the square root of 36 plus the square root of 9 equals the square root of x?
4	What is the probability of getting exactly two heads with three flips of a fair coin?
5	What is seventeen squared minus thirteen squared?
6	Six points are spaced evenly around a circle. How many triangles can be made using three of these points as vertices?
7	What is the log of eighty-one divided by the log of three?
8	What number between 90 and 120 has exactly nine positive factors?

"Math is Cool" Championships -- 2012-13

School:_____ Room # _____ Team #_____

Name: _____ Proctor: _____

High School   <u>Mental Math</u> – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score
When it is time to begin, the proctor will read the first question twice. You may not do any writing or talking while arriving at a solution. Once you have a solution, record it on the sheet in front of you. **You may not change or cross out answers once you have written an answer down. If there are eraser marks, write-overs, or crossed-out answers, they will be marked wrong.** *Once all students have laid their pencils on the desk, another question will be asked. If a student doesn't lay his/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

	Answer	1 or 0	1 or 0
1	27		
2	120		
3	81		
4	3/8		
5	120		
6	20 [triangles]		
7	4		
8	100		

"Math is Cool" Championships - 2012-13
October 19, 2012

High School Grade Individual Contest - Score Sheet

STUDENT NAME: _____

Proctor Name: _____

School Name: _____

Team #: _____ **Room #:** _____

Final Score:

KEY

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	1/27		
2	79		
3	60 [sq in]		
4	0		
5	9 [diagonals]		
6	2		
7	25π [sq cm]		
8	ABC [in that order]		
9	125 [cu un]		
10	90 [°]		
11	2		
12	[x=] -11, 3 [either order]		
13	41 [donuts]		
14	1		
15	49/5		
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16	B) -0.8 [Either]		
17	609π [in²]		
18	16 [subsets]		
19	10 [stickers]		
20	[$]1		
21	6720 [ways]		
22	4		
23	90 [%]		
24	√65		
25	225/2 [cm²]		
26	1/24		
27	16		
28	4280 [ways]		
29	85		
30	284		
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31	4		
32	$\left(-\infty, \frac{4}{3}\right]$		
33	14 [nickels]		
34	60 [terms]		
35	12		
36	4		
37	0		
38	7		
39	5/12		
40	$\left(2, \frac{\pi}{6}, 2\right)$		
31-40 TOTAL:			

High School

Math is Cool" Championships – 2012-13
9th & 10th Grade – October 19, 2012

Student Name_____

Proctor Name_____Room #_____

SCHOOL NAME_____ Team #_____

INDIVIDUAL MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score
This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. It is not necessary to write your personal name on the test, but you may put it at the bottom of the test so your coach will be able to give you back the correct test. This test is taken individually, but it is part of your team score, including zeros for missing team members. Your team score will be calculated by taking the mean of your four team members' scores. When you are prompted to begin, tear off the colored sheet and begin testing. **Since this is a multiple choice test, ONLY a letter response should be indicated as an answer on the answer sheet.** *No talking during the test.*

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	C		
2	C		
3	A		
4	B		
5	B		
6	A		
7	E $[x = -4]$		
8	B		
9	D		
10	B		

"Math is Cool" Championships – 2012-13
9th & 10th Grade – October 19, 2012

SCHOOL NAME_____Team # _____

Proctor Name_____Room #_____

Team Contest – Score Sheet

TEAM TEST - 15 minutes – 30% of team score

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as **1 or 0**. Record all answers on the colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	15		
2	160 [degrees]		
3	7.5 [hours]		
4	$[-87, \infty)$		
5	(1/2, 2, -3)		
6	29/100		
7	$464_{[8]}$		
8	2		
9	$\dfrac{\sqrt{2} + \sqrt{6}}{2}$		
10	$2\pi - 4$		

Final Score:

KEY

First Score

Proctor Name_____Room #_____

SCHOOL NAME_____Team #_____

PRESSURE ROUND - 10 minutes – 5 problems - 5 rounds – 15% of team score

When it is time to begin, you will be handed a packet of five problems. There is a copy of the problems for each team member. Two minutes after the start of the test you are expected to submit an answer for one of the problems (it can simply be a guess). The maximum value of this answer is 1 point. In another two minutes you are expected to submit another answer to one of the four remaining problems; its maximum value is two points. This process will continue until all the problems are answered and each consecutive problem's worth will go up by one point. You must submit your answers on the colored sheets given to you. If you do not have an answer at the end of a two minute period, you must still submit an answer sheet with an identified problem number on it. Failure to do so will result in loss of points. This event is timed, and you will be given a verbal 5 second warning and told to hold your answer sheet up in the air. You may keep working as the sheets are collected. If a team answers the same question more than once, only the first answer will be scored and the other attempts will be ignored.

Pressure Round Answers

	Answer
1	7/72
2	[$] 144 [.00]
3	$\dfrac{1651}{31}$
4	42
5	19

Math is Cool" Championships – 2012-13
11th & 12th Grade – October 19, 2012

Student Name_____

Proctor Name_____Room #_____

SCHOOL NAME_____ Team #_____

INDIVIDUAL MULTIPLE CHOICE - 15 minutes – 10 problems – 20% of team score

This test is the only test where you will be penalized for incorrect responses. You will receive 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. It is not necessary to write your personal name on the test, but you may put it at the bottom of the test so your coach will be able to give you back the correct test. This test is taken individually, but it is part of your team score, including zeros for missing team members. Your team score will be calculated by taking the mean of your four team members' scores. When you are prompted to begin, tear off the colored sheet and begin testing. **Since this is a multiple choice test, ONLY a letter response should be indicated as an answer on the answer sheet.** *No talking during the test.*

DO NOT WRITE IN SHADED REGIONS

	Answer	-1, 0 or 2	-1, 0 or 2
1	C		
2	C		
3	A		
4	A		
5	B		
6	A		
7	E [0]		
8	B		
9	D		
10	A		

"Math is Cool" Championships – 2012-13
11th & 12th Grade – October 19, 2012

SCHOOL NAME_____Team # _____

Proctor Name_____Room #_____

Team Contest – Score Sheet

TEAM TEST - 15 minutes – 30% of team score

*When you are prompted to begin, tear off the colored sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as **1 or 0**. Record all answers on the colored answer sheet.*

DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1	15		
2	30 [degrees]		
3	7.5 [hours]		
4	$[-87, \infty)$		
5	(1/2, 2, -3)		
6	774		
7	$464_{[8]}$		
8	2		
9	$\dfrac{\sqrt{2} + \sqrt{6}}{2}$		
10	3/64		

"Math is Cool" Championships – 2012-13
11th & 12th Grade – October 19, 2012

Proctor Name_____Room #_____

SCHOOL NAME_____Team #_____

PRESSURE ROUND - 10 minutes – 5 problems - 5 rounds – 15% of team score

When it is time to begin, you will be handed a packet of five problems. There is a copy of the problems for each team member. Two minutes after the start of the test you are expected to submit an answer for one of the problems (it can simply be a guess). The maximum value of this answer is 1 point. In another two minutes you are expected to submit another answer to one of the four remaining problems; its maximum value is two points. This process will continue until all the problems are answered and each consecutive problem's worth will go up by one point. You must submit your answers on the colored sheets given to you. If you do not have an answer at the end of a two minute period, you must still submit an answer sheet with an identified problem number on it. Failure to do so will result in loss of points. This event is timed, and you will be given a verbal 5 second warning and told to hold your answer sheet up in the air. You may keep working as the sheets are collected. If a team answers the same question more than once, only the first answer will be scored and the other attempts will be ignored.

Pressure Round Answers

	Answer
1	1/3
2	[$] 144 [.00]
3	$\dfrac{1651}{31}$
4	$\dfrac{70\pi}{3}$ [u^2]
5	19