"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Sponsored by:

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by all involved (competitors and observers). Display of poor sportsmanship will result in disqualification.*
- *Competitors may not use calculators or any other aids on any portion of this contest.*
- *Unless stated otherwise:*
  - *All answers are integers, and any non-integer answers will be "coded" as integers.*
  - *All fractions and ratios must be reduced to simplest form, all radicals must be simplified, and all denominators must be rationalized.*
  - *Do not round or approximate answers. Leave answers in terms of π or other irrational quantities (e.g., √2), where applicable.*
- *Units are not necessary as part of your answer. If you use units, they must be correct.*
- *Record all answers on the colored cover sheets in the answer column only.*
- ***Be sure that the student name, school, team number, etc. has been filled out at the top of each answer sheet.***
- *Tests will be scored as a 0 if answers are not recorded correctly on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*

FINAL SCORES AND AWARDS

Individual awards are determined by both the Mental Math and Individual Test scores. Individual ties are broken based on the following, in this order: total scaled individual points, total number of correct answers on the Individual Test, Mental Math raw score, number of correct answers from Individual Test #31-40, number of correct answers from Individual Test #16-30, highest numbered question answered correctly on the Individual Test working backwards from #40.

Team (School) awards are based on the highest score from amongst each of the school's "teams of 4 students" in each event and is calculated as 2·(Sum of highest 3 Mental Math scores) + 2·(Avg. of Top 3 Ind. Multiple Choice) + 6·(Team) + 2·(Pressure) + 1·(College Bowl), for approximate weights of 25%, 20%, 30%, 15% and 10% respectively. Team ties are broken based on highest event score in order of the events, starting with Mental Math.

MENTAL MATH TEST - 30 sec./quest., 8 problems, ~8%/25% of individ./team scores

The proctor will read each question twice. You may not do any writing or talking while arriving at a solution. Record only your answer on your answer sheet. You may not change, cross out, erase, or write over an answer once you have written it down. The maximum wait time is 30 seconds after completion of the second reading of the question. Correct answers receive 1 point.

INDIVIDUAL TEST - 35 minutes, 40 problems, ~92% of individual score

When you are prompted to begin, tear off the colored answer sheet and begin testing. No talking during this individual test. You will be given a 5 minute time warning. Correct answers receive 2 points for problems 1-30 and 3 points for 31-40 (in the scaled score).

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Final Score *(out of 8)*

Room #	School Name	Student Name	Team #

Mental Math – ~25% of team score & ~8% of individual score

All students in the room will concurrently be asked the same eight questions in this individual test. 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 or her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before the next question is read. You may continue to work on a problem (in your head) while the next question is being read. The raw score is 1 point per correct answer.

STUDENT: DO NOT WRITE IN SHADED REGIONS (or anywhere else, other than the answer box)

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
11/12th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Key

Mental Math Contest – Answer Key

30 seconds per question – ~25% of team score & ~8% of individual score

SCORERS — Write-overs, Cross-outs, and Erasures Must be Marked Incorrect (0)
Bracketed items […] in the answer key are optional.

11/12th Grade

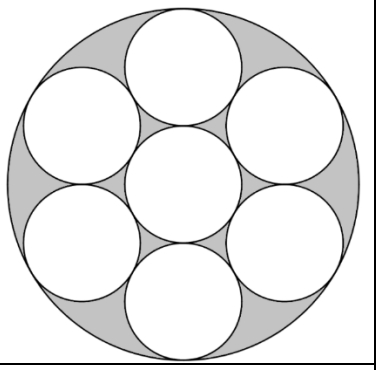
	Answer	
1	375	What is one hundred twenty-five times three?
2	5 [values of x]	How many integer values of x satisfy the following inequality: The absolute value of x is less than the square root of five
3	117	What is the sum of the integers from three to fifteen, inclusive?
4	7 [units]	A right triangle has a leg length of two units, and a hypotenuse length of square root of fifty-three units. In units, what is the length of the other leg?
5	-4 [=x]	Solve for x in the following equation: Negative eight x plus twenty-one equals fifty-three
6	25 [percent]	When a fair coin is flipped four times, what is the probability as a percent that there are exactly three heads?
7	108 [faces]	A three by three Rubik's cube is made of twenty-seven smaller cubes. How many of the small cube faces are NOT visible from the outside of the Rubik's cube?
8	90 [mph]	Aditya starts the first leg of his two hundred and fifty mile road trip by driving one hundred miles at an average rate of thirty miles per hour. If he wants to average fifty miles per hour throughout the whole trip, how many miles per hour does he have to average during the second leg of his trip?

"Math Is Cool" Championships — 2025-26

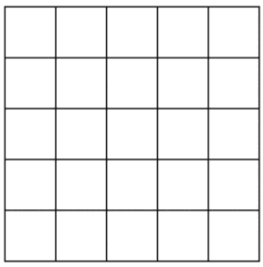
October, 2025

High School Individual Contest

35 minutes, 40 problems, ~92% of individual score.
A 5-minute time warning will be given.

	Questions 1-30: 2 points each
1	How many feet are in 19 miles?
2	Royal paints a wall at a rate of 76 square feet per hour and finishes painting the neighbor's wall in 390 minutes. How many square feet is the neighbor's wall?
3	In how many different ways can Malia pick 3 of the 50 U.S. states to visit for her next trip? The order in which she visits the states matters.
4	What is the minimum function value of the following function: $F(x) = x^2 - 6x + 12$
5	A circle with radius 6 units contains 7 circles of radius 2 units, all mutually tangent, as shown. The shaded area in square units which is inside the large circle but outside the smaller circles can be written as $A\pi$. What is A? 
6	The Utah Jazz are down 0-2 in a best-of-5 game series against the Trailblazers. If the Jazz have a 50% probability of winning each game, the probability that they win the series can be written as simplified fraction 1/A. What is A?
7	What is the next term in the following sequence? 7, 11, 13, 17, 19, 23, 29, …
8	What is the measurement in degrees of one interior angle of a regular nonagon?
9	How many x-intercepts does the following equation have? $y = x^2 - 4x + 14$
10	Evaluate: $3^5 - 2^5 + 4^5$
11	On a Board of Directors of 11 people, in how many ways can one president and one vice president be selected?
12	In degrees, for what value of angle θ in the third quadrant does $\sin(\theta) = -0.5$? Assume $0^\circ < \theta < 360^\circ$.

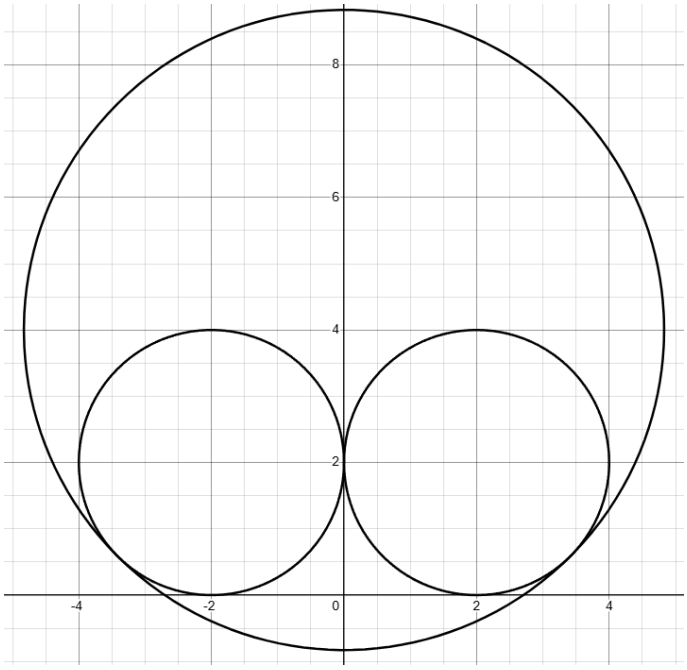
Continued on next page.

13	The mean of the following set of numbers is equal to 2x. What is the value of x? {1, 2, 2, 3, 4, 4, 5, 13, 39, 32, x}
14	At Pullman High School, 30% of the 800 students play tennis and 80% of the students swim. If every student at PHS plays at least either tennis or swims, how many students play both sports?
15	Find the 100^{th} term of the arithmetic sequence with first term 100 and second term 93.
16	What is the greatest common divisor of 210 and 144?
17	In square units, what is the area of the triangle with vertices A, B and C as follows? A(4, 4), B(11, 4), C(-11, -4)?
18	How many squares of any size are in the following figure, which is composed of a grid of unit squares. 
19	What is the ones digit of 7^{2025} ?
20	Two sides of a triangle have lengths 7.4 and 4.3 units. The third side of a triangle has an integer length. What is the sum of all the possible lengths of this third side, in units?
21	Nora is taking a 10 question True/False test. She must answer every question, and each question has either T or F as an answer. If she randomly guesses every question, the probability that she gets at least 8 correct out of 10 can be written as a simplified fraction A/B. What is A + B?
22	What is the determinant of the following 3x3 matrix? $\begin{bmatrix} 2 & 5 & 1 \\ 4 & 3 & 6 \\ 7 & 2 & 1 \end{bmatrix}$
23	Ten students are lined up in the hallway, from shortest to tallest. Their positions are numbered from 1 (shortest) to 10 (tallest). Given the following clues, Shivali is in which number position? • Ella is taller than Anna. • Anna is taller than Kavin. • Kavin is taller than Theo. • Ashwin is taller than Kavin but shorter than Anna. • Isabelle is standing between Shivali and Sarah. • Sarah is shorter than Ella but taller than Isabelle. • Vedant is standing between Ella and Aiden. • Aiden is standing next to Sarah. • Seven students are standing between Vedant and Theo.

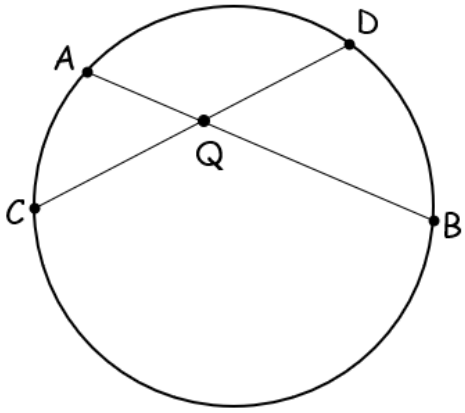
Continued on next page.

24	Triangle ABC has side AB = 13 units, side BC = 14 units, and sin B = 1/7. What is the area in square units of triangle ABC?
25	The quadratic function $f(x) = 2x^2 - 6x + 13$ has roots p and q. What is the value of $p^2 + q^2$?
26	Find the sum of all values of x that satisfy this equation: $$\log_2\left(\frac{1}{2}(x^2 - 6x)\right) = \log_3(27)$$
27	Crozito measures the average temperature for every month of 2025. Through the end of November, the average temperature across 11 months is 45 °F. After December, the average temperature across 12 months is 44 °F. If every month is given the same weight in Crozito's calculations, what was the average temperature in December, in degrees F?
28	The formula of the quadratic equation that passes through the points (-3,0), (4,49), and (1,4) can be written in simplest terms as $f(x) = ax^2 + bx + c$. What is a + b + c?
29	Tiana discovers a magical jar that doubles the amount of money it gives her each day. On day number 1, the jar gives her 1 cent, and on day number 2, the jar gives her 2 cents. On which day number will the total amount of money she has received exceed $100?
30	What is the smallest integer that has more factors than 48?

Challenge Questions: 3 points each

31	The equations of the smaller circles are as follows: $(x - 2)^2 + (y - 2)^2 = 4$ (on right) $(x + 2)^2 + (y - 2)^2 = 4$ (on left) The larger circle, centered at (0,4), is internally tangent to both of the smaller circles. The equation for this circle can be written as: $x^2 + y^2 + ax + by = c\sqrt{d} + e$ where a, b, c, d and e are integers. What is c + d + e? 
32	Pullman High School's concession stand sells hot dogs in packages of 7 and 11. What is the greatest number of hot dogs that cannot be purchased using only these pack sizes?

Continued on next page.

33	Five students each have an assigned seat, but they randomly choose seats without knowing the assignments. In how many ways can they all sit such that no one ends up in their assigned seat?
34	The number $23A2B_7$ (base 7) is divisible by 23 (base 10). If A is odd, what is the value of AB_7 (base 7) in base 10?
35	How many ordered quadruples (a, b, c, d) of non-negative integers satisfy the following equation? a + b + c + d = 13
36	Evaluate the following: $$7+\cfrac{42}{9-\cfrac{351}{18+\cfrac{7}{1-\frac{428}{603}}}}$$
37	Imbert is drawing cards from a standard 52-card deck, one at a time with replacement. If he draws 5 cards, the probability that he draws exactly three cards of one suit can be written as simplified fraction A/B. What is A + B?
38	In the following circle, AQ : QB = 4 : 9, and CQ: QD = 1 : 1. AB : CD can be written in simplest terms as x:y. What is x + y? 
39	How many distinct real solutions are there to the following equation? $(((x^2-1)^2-2)^2-3)^2=4$
40	A sequence of numbers begins as follows. Starting with the third term, each term is equal to the term preceding it minus the term preceding that one. What is the sum of the first 2025 terms of the sequence? 1, 3, 2, -1, …

"Math Is Cool" Championships – 2025-26

KEY

High School Individual Contest – Answer Key

SCORERS: Bracketed […] items in answer key are optional. Just mark the score as 0 or 1 and add up those values to reflect total correct. First Scorer – use the right-hand columns so 2nd scorer can do a blind scoring.

	Answer
1	100320 [feet]
2	494 [sq. ft]
3	117600 [ways, or orders]
4	3 [= minimum]
5	8 [= A]
6	8 [= A]
7	31 [= next term]
8	140 [degrees]
9	0 [x-int]
10	1235
11	110 [ways]
12	210 [°]
13	5 [= x]
14	80 [students]
15	-593 [= 100^{th} term]

	Answer
16	6 [= gcd]
17	28 [sq. units]
18	55 [squares]
19	7 [= ones digit]
20	60 [units]
21	135 [= A + B]
22	159 [= det]
23	5 [= Shivali's position]
24	13 [sq units]
25	-4 [= $p^2 + q^2$]
26	6 [= sum of values of x]
27	33 [degrees F]
28	4 [= a + b + c]
29	14 [days, or day number]
30	60

	Answer
31	6 [= c + d + e]
32	59 [hot dogs]
33	44 [ways]
34	40 [base 10]
35	560 [ordered quadruples (a, b, c, d)]
36	70
37	173 [= A + B]
38	25 [= x + y]
39	7 [distinct real solutions]
40	6 [= sum]

"Math Is Cool" Championships – 2025-26

Total Correct (all columns)

Room # _____ SCHOOL NAME _____ STUDENT NAME _____ Team # _____

Individual Contest – Score Sheet

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
1-15 TOTAL:			

	Answer	1 or 0	1 or 0
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			
16-30 TOTAL:			

	Answer	1 or 0	1 or 0
31			
32			
33			
34			
35			
36			
37			
38			
39			
40			
31-40 TOTAL:			

High School

October, 2025

Scorers: Just score as 0 or 1 and add up those values (i.e., just work with number correct).

"Math Is Cool" Championships — 2025-26

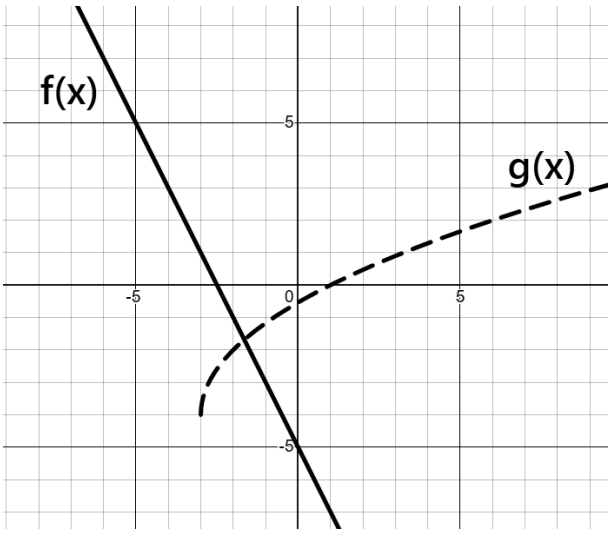
11/12th Grade — October, 2025

Individual Multiple Choice Contest

1 The numbers 2, 13, -4, 4/5, x, and y have a mean of 12.8. What is the mean of the two numbers x and y?

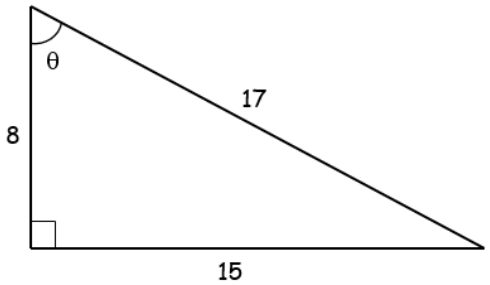
A) 13.0 B) 15.8 C) 30 D) 32.5 E) Answer not given

2 Which of the following best approximates the value of f(g(1))?



A) -7 B) -5 C) 0 D) 2 E) -2

3 For the right triangle shown here, find the value of $\sin\theta + \cos\theta$.



A) 1 B) 35/8 C) 23/17 D) 5/3 E) Answer not given.

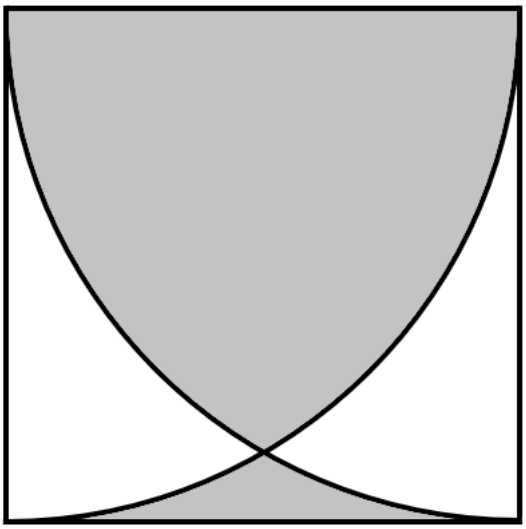
4 How many positive factors does the number 2160 have?

A) 28 B) 16 C) 32 D) 40 E) Answer not given.

5 The expression $((2x)^{-1} + y)^{-1}$ is equivalent to which of the following?

A) $\frac{1+2xy}{2x}$ B) $\frac{2xy+1}{y}$ C) $\frac{2x}{1+2xy}$ D) $\frac{y}{2xy+1}$ E) Answer not given.

Continued on next page.

6	What is the sum of the following series? -2 + 13 + 28 + 43 + ... + 1168 + 1183 A) 47240 B) 46057 C) 48438 D) 48453 E) Answer not given.
7	How many times does Posey have to roll a standard 6-sided die until the expected value of the sum of the rolled numbers exceeds 50? A) 13 B) 14 C) 15 D) 16 E) Answer not given.
8	At 12 a.m. on Christmas Eve (December 24), Dominic remarks that "In 1,000,000 seconds, it'll be my birthday!" What is the date of Dominic's birthday? A) January 2nd B) January 3rd C) January 4th D) January 5th E) Answer not given.
9	Two quarter circles are drawn within a square of side length 4 centimeters as shown below. What is the total area of the shaded regions?  4 cm A) $16-4\sqrt{3}+\frac{4\pi}{3}$ cm^2 B) $16-8\sqrt{3}+\frac{8\pi}{3}$ cm^2 C) $8-8\sqrt{3}+3\pi$ cm^2 D) 1 cm^2 E) Answer not given.
10	Harley has three marbles that are different colors: red, green and blue. Harley randomly selects a non-empty subset of the marbles and puts them in a bag. Jack then draws three marbles from the bag, one at a time with replacement. Their colors are red, blue and red. What is the probability that the only marbles in the bag are red and blue? A) $\frac{11}{54}$ B) $\frac{1}{2}$ C) $\frac{35}{432}$ D) $\frac{27}{35}$ E) Answer not given.

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11/12th Grade — October, 2025

Key

Individual Multiple Choice Contest – Answer Key

11/12th Grade

Correct responses are worth 2 points, incorrect responses are worth -1 point, and absence of a response is worth 0 points.

	Answer
1	D
2	B
3	C
4	D
5	C
6	A
7	C
8	C
9	B
10	D

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Final Score *(out of 20)*

Room # **School Name** **Student Name** **Team #**

Individ. Multiple Choice Contest – 15 minutes – ~20% of team score

You will have 15 minutes to answer 10 multiple choice questions. This test is taken individually, but it is part of your team score, which will be calculated by taking the mean of the top 3 scores from your team. This test is the only test where you will be penalized for incorrect responses. You will receive two points for a correct letter response, zero points for leaving it blank, and minus one point for an incorrect response. When you are prompted to begin, tear off the colored answer sheet and begin testing. **ONLY a letter response should be listed as an answer on this answer sheet.**

Correct responses are worth 2 points, incorrect responses are worth -1 point, and absence of a response is worth 0 points.

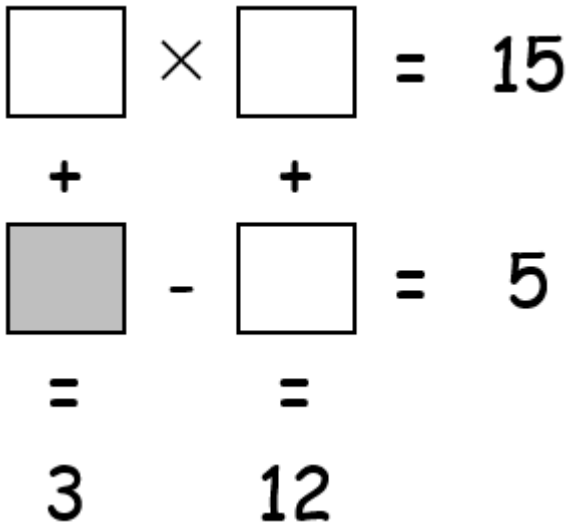
STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 -1, 0, or 2	Scorer 1 -1, 0, or 2
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11/12th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Team Contest

1	A standard iPhone 14 is shaped like a rectangular prism, with dimensions of 15 centimeters, 7 centimeters, and 8 millimeters. What is the volume of this iPhone 14, in cubic millimeters?
2	What is the largest integer n such that n^2 is a divisor of $24 \cdot 35 \cdot 46 \cdot 57$?
3	Let X = the area of the quadrilateral on the coordinate plane with the following vertices: A (4,10), B (9,7), C (11,2) and D (2,2) What is the value of 2 times X?
4	Alek has 21 coins, a mixture of dimes and quarters. If the dimes were quarters and the quarters were dimes, Alek would have $1.35 more than he has now. How many quarters does he currently have?
5	An integer from 1 through 70 inclusive is randomly chosen. The probability that it is not prime can be written as simplified fraction A/B. What is A + B?
6	In a list of 100 numbers, we know that there are at least 50 distinct values. How many times must a single number be repeated to ensure that it must be the unique mode?
7	In the following puzzle, which may have more than one solution, fill in the boxes with one number each to make the four equations true. There are two equations reading across the rows, and two equations reading down the columns. What is the sum of the values that go in the shaded square, for all valid solutions? 
8	How many positive three digit integers less than 600 exist where the sum of the tens and ones digit equals the hundreds digit?

Continued on next page.

9	How many integer values of x satisfy the following: $$\|2x - 7\| > x^2 - 4x + 3$$
10	An infinite sequence of numbers is formed as follows, where the n^{th} number is repeated n times: 122333444455555… What is the 2026^{th} digit in this sequence?

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Key

Team Contest – Answer Key

11/12th Grade

	Answer
1	84,000 [mm^3]
2	12 [= n]
3	91 [= 2X] [= twice the area]
4	6 [quarters]
5	121 [= A + B]
6	27 [= times, or number of times]
7	20 [= sum of values in shaded square]
8	20 [integers]
9	5 [values of x]
10	4 [= the 2026th digit]

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Final Score *(out of 10)*

Room # _____ **School Name** _____ **Team #** _____

Team Contest – 15 minutes – ~30% of team score

You will have 15 minutes to answer 10 questions as a team. When you are prompted to begin, tear off the colored answer sheet and give a copy of the test to each of your team members and begin testing. Each problem is scored as a 1 or 0. Record all answers on this colored answer sheet.

STUDENTS: DO NOT WRITE IN SHADED REGIONS

	Answer	Scorer 2 0 or 1	Scorer 1 0 or 1
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11/12th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Pressure Round Contest – Cover Sheet

DO NOT LOOK BEYOND THIS SHEET UNTIL THE PROCTOR SAYS 'GO'!

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Pressure Round Contest – Cover Sheet

DO NOT LOOK BEYOND THIS SHEET UNTIL THE PROCTOR SAYS 'GO'!

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Pressure Round Contest

1	Nikko rolls 4 standard 6-sided dice. The probability that the product of the 4 resulting numbers is divisible by 4 can be written as a simplified fraction A/B. What is A + B?
2	Lizette reads 3 pages of a book on the first day, 6 on the second, 9 on the third, and so on. How many days will it take her to finish a 405 page book?
3	How many different arrangements can be created using all of the letters in "MATHISCOOL"?
4	The point (-7, 1) is rotated about the point (-2, -1) clockwise by 90 degrees. This point is then reflected over the x-axis, after which it is shifted to the right by 4 units. The final coordinates of this point are (A, B). What is A + B?
5	On the planet of Mathland, one Beta is worth 5 Alphas, One Chi is worth 17 Deltas, 2 Epsilons are worth 13 Alphas, and 1 Delta is worth three Betas. How many Alphas are 3 Chis worth?

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11/12th Grade — October, 2025

Pressure Round Contest

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5	On the planet of Mathland, one Beta is worth 5 Alphas, One Chi is worth 17 Deltas, 2 Epsilons are worth 13 Alphas, and 1 Delta is worth three Betas. How many Alphas are 3 Chis worth?

"Math Is Cool" Championships — 2025-26

11/12th Grade — October, 2025

Final Score *(out of 15)*

Room # _____ **School Name** _____ **Team #** _____

Pressure Round Score Sheet

Submittal # (order turned in)	1	2	3	4	5
Question #					
Score (circle value)	0 or 1	0 or 2	0 or 3	0 or 4	0 or 5
Scoring Room (checkmark)					

Team: Fill in the room, school, and Team #, then hand only this sheet to the Proctor.
Proctor: staple this to the top of the five submittals in order.

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Final Score *(out of 15)*

Room # _____ **School Name** _____ **Team #** _____

Pressure Round Score Sheet

Submittal # (order turned in)	1	2	3	4	5
Question #					
Score (circle value)	0 or 1	0 or 2	0 or 3	0 or 4	0 or 5
Scoring Room (checkmark)					

Team: Fill in the room, school, and Team #, then hand only this sheet to the Proctor.
Proctor: staple this to the top of the five submittals in order.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
1 (at 2 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
1 (at 2 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
2 (at 4 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
2 (at 4 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
3 (at 6 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
3 (at 6 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
4 (at 8 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
4 (at 8 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
5 (at 10 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room # _____ **School Name** _____ **Team #** _____

Pressure Round Answer Submittal

Submittal #	for Question #	Answer
5 (at 10 minute mark)		

Team: Fill in the room, school, and Team # before the round starts.
Write the question number being answered and the associated answer (or a blank).
You may answer questions in any order. A question may not be answered more than once.

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Room #	School Name	Team #

Total Score for Each Round

College Bowl #1 (10 Possible)	College Bowl #2 (10 Possible)	College Bowl #3 (10 Possible)

DO NOT USE TALLY MARKS ON THIS SHEET. WRITE THE TOTAL SCORE FOR EACH ROUND.

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Room #	School Name	Team #

Total Score for Each Round

College Bowl #1 (10 Possible)	College Bowl #2 (10 Possible)	College Bowl #3 (10 Possible)

DO NOT USE TALLY MARKS ON THIS SHEET. WRITE THE TOTAL SCORE FOR EACH ROUND.

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Proctor Copy

Mental Math Contest

MENTAL MATH – 30 seconds per question – ~25% of team score & ~8% of individual score

All students in the room will concurrently be asked the same eight questions in this individual test. 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 or her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before the next question is read. You may continue to work on a problem (in your head) while the next question is being read. The raw score is 1 point per correct answer.

1	What is one hundred twenty-five times three?	
2	How many integer values of x satisfy the following inequality: The absolute value of x is less than the square root of five	
3	What is the sum of the integers from three to fifteen, inclusive?	
4	A right triangle has a leg length of two units, and a hypotenuse length of square root of fifty-three units. In units, what is the length of the other leg?	
5	Solve for x in the following equation: Negative eight x plus twenty-one equals fifty-three	
6	When a fair coin is flipped four times, what is the probability as a percent that there are exactly three heads?	
7	A three by three Rubik's cube is made of twenty-seven smaller cubes. How many of the small cube faces are NOT visible from the outside of the Rubik's cube?	
8	Aditya starts the first leg of his two hundred and fifty mile road trip by driving one hundred miles at an average rate of thirty miles per hour. If he wants to average fifty miles per hour throughout the whole trip, how many miles per hour does he have to average during the second leg of his trip?	

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Key

Pressure Round Contest – Answer Key

11/12th Grade

	Answer
1	85 [= A + B]
2	16 [days]
3	1,814,400 [arrangements]
4	0 [= A + B]
5	765 [alphas]

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Key

COLLEGE BOWL ROUND #1

#	Problem	Answer
1	Eli builds chairs with three legs. If he makes twenty-six chairs, how many legs are there in total?	78 [legs]
2	Gracie draws a snowman using three circles stacked on top of each other with radii (pronounced ray-dee-eye) of one, two, and three inches, respectively. The total area of the snowman is A pi square inches. What is A?	14 [= A]
3	Linley drives three hundred ninety-six miles from Spokane to Seattle, first driving three hours at sixty miles per hour, then driving three hours at X miles per hour. What is X?	72 [= X] [= miles per hour]
4	Nayoun and Phillip are playing a game. After X rounds, Phillip has a win percentage of fifty percent. The next round, Phillip loses and now has a win percentage of forty percent. What is the value of X?	4 [= X] [= rounds]
5	In square units, what is the area of the triangle enclosed by the graphs of the three lines: y equals two, three x plus two y equals sixteen, and y minus x equals eight?	30 [units squared]
6	On a wall clock, the hour hand is twelve inches long. From nine o'clock AM to nine thirty AM on the same day, the area swept out by hour hand is A times pi inches squared. What is A?	6 [= A]
7	Zayd rolls two ten-sided dice, which are numbered zero through nine. As a percentage, what is the probability that both dice are showing a prime number?	16 [%]
8	What number comes next in the sequence that begins as follows: One, three, seven, fifteen, and so on.	31 [is next number]
9	What is the reciprocal of the cosine of sixty degrees?	2 [=reciprocal]
10	For how many integer values of n can you make a triangle with side lengths 4, 5, and n?	7 [different values of n]

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Key

COLLEGE BOWL ROUND #2

#	Problem	Answer
1	When a coin is flipped four times, what is the probability in percent of getting an odd number of heads?	50 [percent]
2	How many days are in the last ten months of the year?	306 [days]
3	What is the sum of the first six positive multiples of six?	126 [= sum]
4	This year at Pullman High School, twenty percent of students take calculus and forty percent of students take statistics. If there are eight hundred students total, and one hundred of them are taking both calculus and statistics, how many students are taking neither?	420 [students]
5	An ant walks along the edges of a cube, walking the length of one edge every minute, and randomly choosing which adjacent edge to walk along next each time it arrives at a vertex. If the ant starts at vertex A, after exactly five minutes what is the probability in percent that the ant will have returned back to vertex A?	0 [percent]
6	If the operation a star b is equal to a squared plus b squared, what is the positive difference between ten star five and eight star nine?	20 [= positive difference]
7	How many positive integers less than one thousand are divisible by both three and seventeen?	19 [pos integers]
8	What is log base ten of fifty plus log base ten of twenty?	3
9	Vijay has twelve chickens, three roosters, fourteen pigs, and one three-legged dog on his farm. How many legs are there on his farm, including his own?	91 [total legs]
10	In a geometric sequence, the seventh term is eight and the thirteenth term is twelve. What is the twenty-fifth term in this sequence?	27 [= 25th term]

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Key

COLLEGE BOWL ROUND #3

#	Problem	Answer
1	If four raised to the x plus four raised to the x plus four raised to the x equals one hundred ninety-two, what is the value of x?	3 [= x]
2	If the mean of the following data set is equal to five, what is the value of x? Two, three, four, four, five, six, x	11 [= x]
3	A square with side length four units has one inscribed circle and one circumscribed circle. The positive difference in the area of the two circles is A pi square units. What is A?	4 [= A]
4	How many positive factors does one hundred twenty-six have?	12 [positive divisors]
5	Let f of x equal x squared plus three x plus five. What is the value of **f of f of one**? (**proctor** – make sure to read very carefully)	113 [= f(f(1)] [= f of f of 1]
6	One endpoint of a line segment is three comma negative three, and the midpoint is seven comma five. What is the y coordinate of the other endpoint of the line segment?	13 [= y coor]
7	Iowa borders six states: Wisconsin, Minnesota, South Dakota, Nebraska, Missouri, and Illinois. If one of the fifty US States is randomly selected, what is the probability in percent that it is not Iowa or any of Iowa's bordering states?	86 [%]
8	A palindrome is an integer that reads the same forwards and backwards, such as one hundred thirty-one. How many palindromes are there between ten and one hundred?	9 [palindromes]
9	There are sixty-five dogs, either large or small, competing in a dog show. There are eleven fewer small dogs than large dogs. How many small dogs are there?	27 [small dogs]
10	What is the maximum value of the following function? f of x equals negative x-squared plus eight x plus four	20 [= max function value]

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Key

COLLEGE BOWL ROUND #4

#	Problem	Answer
1	An angle measuring five pi over six radians is equal to how many degrees?	150 [degrees]
2	What is three raised to the fifth power minus two raised to the seventh power?	115
3	How many pints are there in 5 quarts?	10 [pints]
4	There are five juniors and four seniors running for two class officer positions, which are non-distinguishable. If the elected pair must be two people of the same class, how many possible pairs of elected officers can there be?	16 [ways]
5	Catarina's dinner bill is forty dollars and eighty cents. If she leaves a twenty percent tip, what is the total cost in cents?	4896 [cents]
6	When two fair six sided dice are rolled, what is the probability that the sum of the two numbers rolled equals seven, rounded to the nearest percent?	17 [percent]
7	Two cars begin driving directly towards one another from a distance of six hundred meters apart. Each car moves at a speed of sixty meters per second. At the same time, a fly starts flying back and forth between the two cars at a speed of thirty meters per second. In How many meters will the fly have traveled by the time the two cars meet?	150 [meters]
8	For what value of x is x squared minus four x plus two hundred forty minimized?	2 [= x]
9	If a is a positive integer and b is a negative integer, what quadrant number is the point b comma a in?	2 [= quadrant]
10	Shivali draws a regular hexagon and an equilateral triangle. Both polygons have equal side lengths. If the hexagon has an area of forty-two square units, what is the area of the triangle in square units?	7 [sq units]

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Key

COLLEGE BOWL ROUND #5

#	Problem	Answer
1	How many x-intercepts does the following equation have? Y equals x squared minus twelve x plus eleven.	2 [x-intercepts]
2	A baseball weighs two hundred grams, and a tennis ball weighs one hundred fifty grams. If there are a combined total of seven balls, and their total weight equals one point two kilograms, how many baseballs are there?	3 [baseballs]
3	Theo has between one hundred and two hundred jellybeans. He divides them among his thirty-seven friends (not including himself), and finds that everyone gets the same number of jellybeans. If Theo has an even number of jellybeans, how many jellybeans does he have?	148 [jellybeans]
4	If f of quantity x minus one equals x squared plus one, what is the value of f of two?	10 [= f(2)]
5	What is the smallest positive angle in degrees that is coterminal with a negative two hundred forty-five degree angle?	115 [°]
6	One integer from fifty-one to eighty, inclusive, is selected. The probability that the integer is prime is a reduced fraction A over B. What is A + B?	37 [= A + B]
7	In a bag, there are fifty-seven white marbles, forty-three black marbles, thirteen blue marbles, and ninety-nine gray marbles. What is the minimum number of marbles that must be randomly selected to guarantee having least three different colors of marbles?	157 [marbles]
8	Five friends are sitting around a circular table. If seatings that are simply rotations of each other count as the same arrangement, in how many unique ways can they be seated?	24 [ways]
9	A square piece of paper is folded in half horizontally to form a rectangle. The rectangle has a perimeter of two hundred fifty-eight inches. In inches, what is the perimeter of the original square?	344 [inches]
10	How many millimeters are in a kilometer?	1,000,000 [mm] [one million]

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Key

COLLEGE BOWL ROUND #6

#	Problem	Answer
1	Rafferty eats pizza at a rate of one point five slices per minute. If there are two whole pizzas, each with nine slices, how many minutes will it take Rafferty to finish eating both pizzas?	12 [minutes]
2	In the following set of numbers, given that the mode is one greater than the mean, what is the value of x? Two, three, three, three, four, five, x	-6 [= x]
3	The point a comma a is equidistant from the points one comma five and seven comma three on the coordinate plane. What is the value of a?	4 [= a]
4	What is the value of the palindrome that is closest in value to the integer twelve thousand three hundred forty-five?	12321 (twelve thousand three hundred twenty-one) [= palindrome]
5	In a standard fifty-two card deck, how many cards must be drawn without replacement to guarantee that all the cards of a single suit have been drawn?	49 [cards]
6	An equilateral triangle of side length six units can be divided into how many equilateral triangles of side length two units?	9 [triangles]
7	Maria has a set of ten index cards labeled with the digits zero through nine. If one card is randomly selected, what is the probability in percent that it is at most five?	60 [%]
8	How many positive even multiples of three are less than 100?	16
9	Out of seven different paint colors, how many ways can three colors be chosen, where one color will be the background and the other two will be mixed to create the color for the foreground?	105 [ways]
10	A cash machine contains three times as many five-dollar bills as ten-dollar bills. If it contains three thousand dollars worth of five and ten dollar bills, how many five dollar bills are there?	360 [5 $ bills]

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Key

COLLEGE BOWL — EXTRA Questions

#	Problem	Answer
1	In how many different ways can the following letters be arranged? A, B, C, A, D, B	180 [arrangements] [ways]
2	In how many ways can you pay one dollar using only nickels and dimes?	11 [ways]
3	What is the median of the following data set: Twenty-five, twenty-three, seventeen, fifteen, nineteen, twenty-one, twenty-eight, thirty, twenty-six and twenty-eight	24 [= median]
4	How many integers lie between four squared and four cubed, not including four squared and four cubed?	47 [integers]
5	A rectangle has an area of fifty-four square inches. Its length and width are both tripled. In square inches, what is this new rectangle's area?	486 [sq in.]
6	What is the sum of the smallest 8 prime numbers?	77
7	X Y Z W is a parallelogram with diagonals that intersect at point A. Given that Y A equals two t, W A equals three t minus four, and X Z equals five t, what is the value of X A?	10 [= X A]
8	An architect built a scale model of a two hundred twenty foot tall building. The model is twenty-five inches tall and ten inches wide. How many feet wide is the actual building?	88 [feet]