"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

Sponsored by:

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by <u>all</u> 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, However, if you choose to 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 — 2024-25

11/12th Grade — October, 2024

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 — 2024-25

11/12th Grade — October, 2024

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

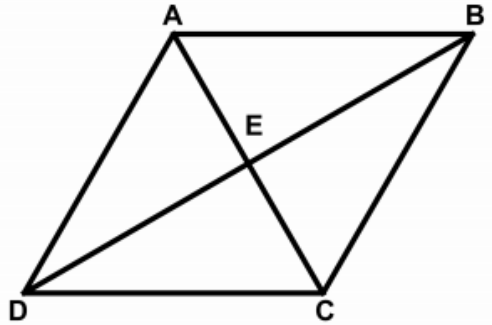
	Answer	
1	23300	What is forty-one thousand seven hundred twenty minus eighteen thousand four hundred twenty?
2	7 [integers]	How many integers 'x' satisfy the following equation: The absolute value of 'x' is less than pi
3	4 [= $b^2 - ac$]	If a, b and c are positive consecutive even integers, with c greater than b greater than a, what is the value of b-squared minus 'ac'?
4	330[square inches]	The sides of a triangle are eleven, sixty and sixty-one inches. In square inches, what is the area of the triangle?
5	21	What number is one-third of the way from negative four to seventy-one, and closer to negative four?
6	400 [minutes]	Two students working at a constant rate can paint one classroom in five hours. How many minutes would it take three students working at the same constant rate to paint two classrooms?
7	25 [points]	Amy's average on her six math tests this semester is seventy-five points. Fortunately, her teacher drops each student's lowest grade, which raises Amy's average to eight-five. What was her lowest test grade, in points?
8	648 [5-digit palindromes]	A palindrome is a number that reads the same forwards and backwards, like one hundred twenty-one. How many five-digit palindromes are there that do not include the digit nine?

"Math Is Cool" Championships — 2024-25

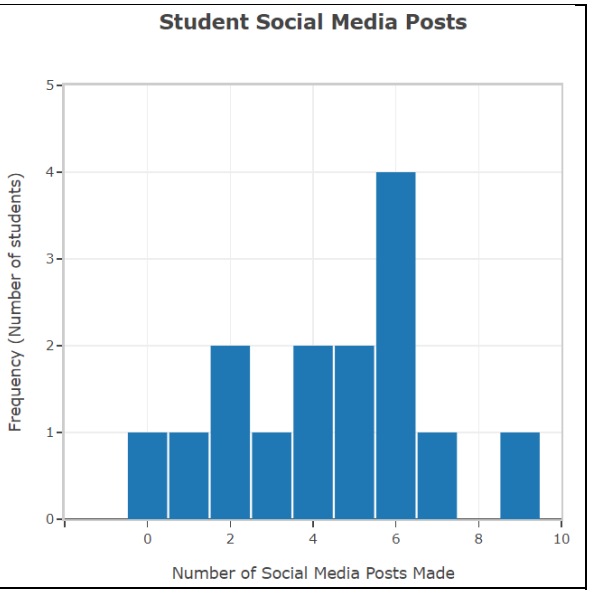
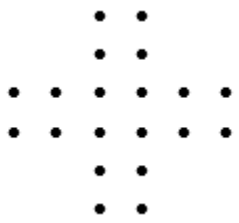
October, 2024

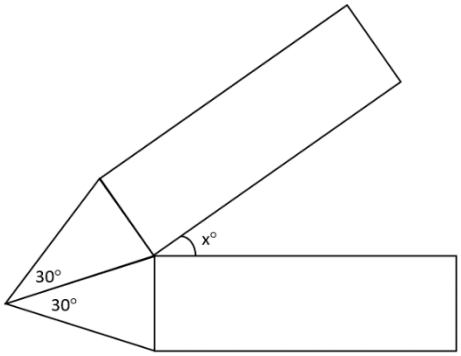
High School Individual Contest

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 pints are in seven gallons?
2	The points A, B, C and D all lie on the same line segment, in that order from left to right. The ratio of AB:BC:CD is equal to 2:1:3. If AD = 6 units, what is the length of BD in units?
3	If the Southridge High School math team consists of 8 students, in how many ways can a team of 4 students be selected for the Math Is Cool Masters competition?
4	How many of the following values for 'x' make the inequality true? $-3x < 60$ {-30, -21, -17, -25, -20, -15, -23, -19, -10, 0, 15}
5	A vendor at a farmer's market puts 18 potatoes into 'n' bags such that each bag contains the same number of potatoes. There is more than one potato and fewer than 18 potatoes in each bag. What is the sum of all possible values of 'n'?
6	What is the next number in the following sequence? 3, 10, 31, 94, 283, …
7	A spinner is divided into 15 equal sections, numbered 1 through 15. When the spinner is spun one time, the probability that it lands on a multiple of 5 or a multiple of 3 can be written as a reduced common fraction A/B. What is A + B?
8	In rhombus ABCD, the measure of angle ABE equals 34°. If the measure of angle CBE equals (2x – 2)°, what is the value of x? 
9	A school district orders 10 boxed lunches from Panera for a total of $107.50. If each boxed lunch costs the same amount, how much do 19 boxed lunches cost, in cents?

Continued on next page.

10	Mr. Tosch gathered data from his Statistics students on how many social media posts each student had made the previous day. How many students made at least 3 social media posts? 
11	Evaluate: $8 + 6 \times 4^2 - 16$
12	Exactly one of the following statements is false, and the rest are true. Which statement is false? Answer with the statement number: 1, 2, 3 or 4. 1. Statement 4 is true. 2. Statement 1 is false. 3. Statement 2 is false. 4. Statement 3 is true.
13	Solve for x in the following equation: $\frac{8}{3x+9} = \frac{3}{3x-6}$
14	Zhanlu spends $450 of his $1800 monthly income on food. What percent of his monthly income does not go towards food?
15	Find the 77^{th} term of the arithmetic sequence that begins: 14, 3, -8, …
16	What is the greatest common divisor of 2024! and 2024! + 1?
17	The following dots are equally spaced on a grid of horizontal and vertical lines. How many squares can be created by connecting any four of the dots? 
18	How many x-intercepts does the following parabola have? $y = x^2 - 6x + 13$
19	On a test that has a normal (bell-shaped) distribution, a score of 38 points falls two standard deviations above the mean, and a score of 14 points falls two standard deviations below the mean. In points, what was the mean of the test?
	Continued on next page.

20	In the following diagram, two congruent isosceles triangles share a side, and have one angle measuring 30°. Attached to each triangle is a rectangle that shares a side with the base of the triangle. In degrees, what is the measure of angle x? 
21	Mrs. Stephenson has 20 students in her Statistics class. On Wednesday she gave a test, and also an assignment was due. Ten students passed the test, and 14 students completed the assignment. There were 4 students who failed the test and also did not complete the assignment. As a percentage, what is the probability that a student completed the assignment, given that they passed the test?
22	The following pattern of numbers continues infinitely. What number is exactly in the middle of Row 18? 1 — Row 0 1 1 — Row 1 1 2 1 — Row 2 1 3 3 1 — … 1 4 5 4 1 1 5 7 7 5 1 1 6 9 10 9 6 1 … … … … … … … …
23	Given the function f(x), such that: $f(x) = x^2 + bx + c$ $f(-1) = 1$ $f(-3) + f(2) = -1$ Find the value of f(4).
24	On the coordinate plane, the point (4, -1) is reflected over the point (0, -3) to a point (x, y). What is x + y?
25	Find the sum of all possible values of x that make the following equation true: $\log(2x + 3) + \log(x - 4) = \log(x^2 + 12)$
26	Gibson has the following set of cards, which he turns face downward, shuffles, and then randomly selects three of the cards. As a percentage, what is the probability that the sum of the numbers on the three cards is a Fibonacci number? In other words, a number in the Fibonacci sequence that begins: 0, 1, 1, 2, and so on, where each term from the third term on is the sum of the previous two terms. **1** **1** **2** **3** **5**
27	In a non-equilateral triangle, the length of each side of the triangle is an integer number of units. In units, what is the smallest possible perimeter of the triangle?

Continued on next page.

28 A real estate agent is trying to predict the average selling price of a 3-bedroom house based on its distance from a certain city, using the following data:

Distance from city (miles)	Selling Price ($)
10	755,000
50	580,000

Using a linear model based on these two data point, what is the predicted selling price in dollars for a 3-bedroom house that is 95 miles away from the city?

29 When the following expression is fully expanded, how many of the resulting terms have at least two variable factors that are vowels? Reminder that the vowels are: a, e, i, o and u.

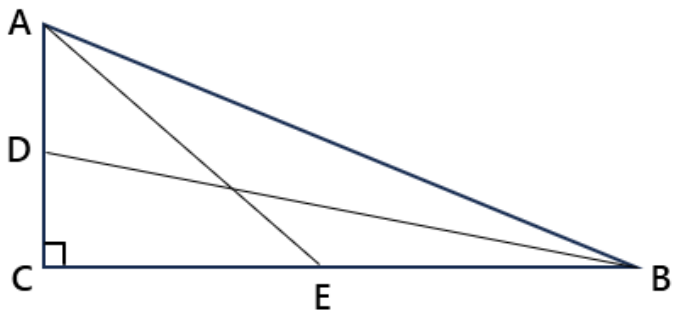
$$(a+p)(e+q)(i+r)(o+s)(u+t)$$

30 Steve has a calculator that only has one operation. When given a number, the calculator adds 6 to it. Jordan similarly has a calculator that does one thing: it takes a number and squares it. Alice gives Steve a number 'a'. Steve plugs 'a' into his calculator and gives the result to Jordan who plugs it into his calculator. He gives Alice the result. Similarly, Adam gives another number 'b' to Steve who computes it, passes the result to Jordan, who computes it and gives the result to Adam.

If Alice and Adam both got the same number back and $a \neq b$, what is $a + b$?

Challenge Questions: 3 points each

31 In right triangle ABC, points D and E are the midpoints of sides AC and BC, respectively. The length of AE = 19 units, and the length of BD = 22 units. In units, what is the length of the hypotenuse, AB?



32 If three people are selected at random, the probability that at least two of them were born on the same day of the week can be written as a reduced common fraction A/B.

What is A + B? None of the people are related to each other.

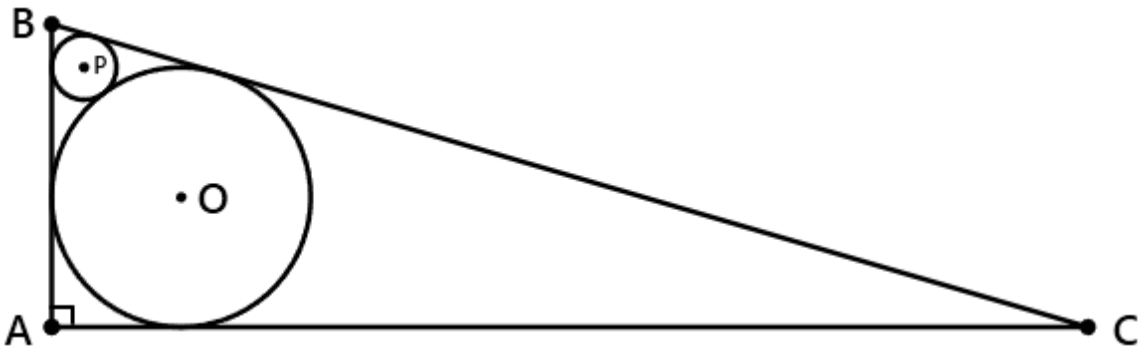
33 Find the sum of the following finite arithmetic series.

$$7 + 14 + 28 + \cdots + 229{,}376$$

34 Let r and s be the roots of the following equation: $x^2 + x + 1 = 0$

Find the value of: $r^2 + s^2 + r + s + rs$

Continued on next page.

35	How many positive 5-digit integers have the property that every pair of adjacent digits have different parity? Note: parity indicates the oddness or evenness of the digits.
36	A 5-digit whole number has the following feature. If the digit '1' is added to the beginning of the number, the new number is four times smaller than if the digit '4' is added to the end of the original number. What is the original 5-digit number?
37	On a scale from 0 to 10, where 0 = the least fun and 10 = the most fun, how much fun are you having on this test? Note: your answer must be an integer, and the answer is > 9 and < 11.
38	Triangle ABC has a right angle at vertex A, and contains circles O and P. Circle O has a radius of 4 units, and is tangent to each side of the triangle. Circle P has a radius of 1 unit, and is tangent to two sides of the triangle and to circle O. The area of triangle ABC can be written as a reduced common fraction $\frac{N}{3}$. What is N? 
39	Evaluate the following definite integral: $$\int_{-3}^{3} (3 - \lvert x \rvert)\, dx$$
40	How many positive divisors of 360 have fewer than 7 divisors themselves?

"Math Is Cool" Championships – 2024-25

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	56 [pints]
2	4 [units]
3	70 [ways]
4	6 [values of x]
5	20 [= sum]
6	850
7	22 [= A + B]
8	18 [= x]
9	20425 [cents]
10	11 [students]
11	88
12	2 [is false]
13	5 [=x]
14	75 [%]
15	-822 [= 77th term]

	Answer
16	1 [= gcd]
17	21 [squares]
18	0 [x-intercepts]
19	26 [points]
20	30 [°]
21	80 [%]
22	82
23	-54 [= f(4)]
24	-9 [= x + y]
25	8 [sum =]
26	30 [%]
27	5 [units]
28	383125 [$]
29	26 [factors]
30	-12

	Answer
31	26 [units]
32	68 [= A + B]
33	458,745 [= sum]
34	-1
35	5625 [integers]
36	66666
37	10 [= the most fun]
38	448 [=N]
39	9
40	14 [divisors]

"Math Is Cool" Championships – 2024-25

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, 2024

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

"Math Is Cool" Championships — 2024-25

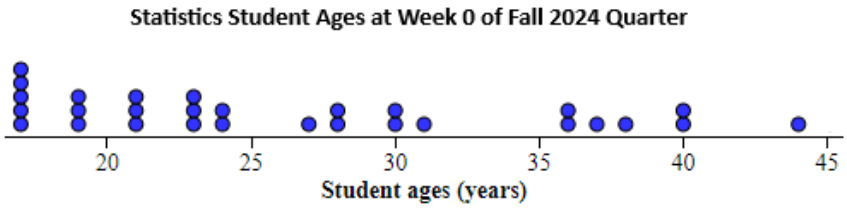
11/12th Grade — October, 2024

Individual Multiple Choice Contest

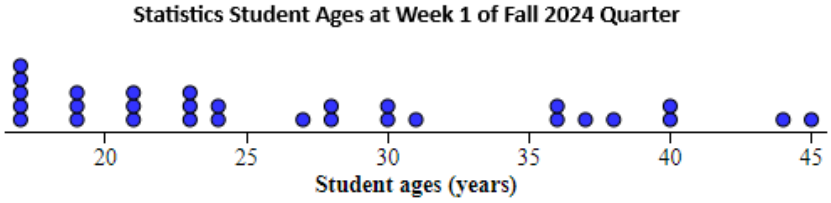
1 The hypotenuse of a right triangle is twice the length of one of the legs, and the other leg has length 10 cm. What is the length of the hypotenuse?

A) $\frac{10\sqrt{3}}{3}$ cm B) $2\sqrt{5}$ cm C) $\frac{20\sqrt{3}}{3}$ cm D) $4\sqrt{5}$ cm E) $10\sqrt{5}$ cm

2 In Mrs. Stephenson's Fall 2024 Statistics class, she recorded the following ages in integer years for her students during Week 0, where each dot represents one student's age:



During the first week of class, another student enrolled, who happened to be 45 years old, resulting in an updated plot:



For these data sets, which of the following values were increased in Week 1, compared to Week 0 of the quarter?

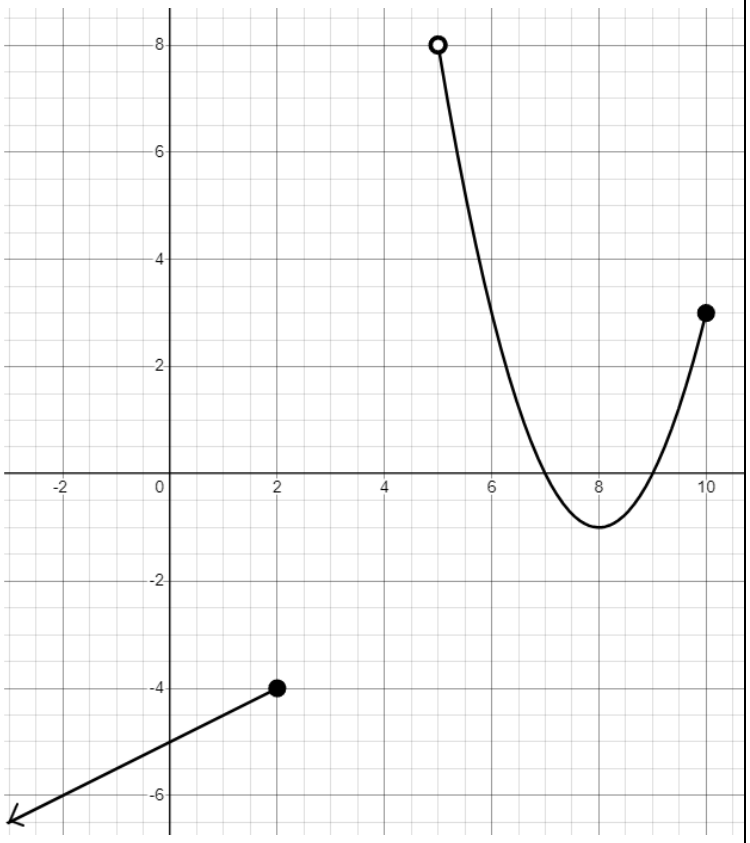
A) Mean, median, and range
B) Median, mode and range
C) Median and range
D) Mean and range
E) Answer not given

3 If $tan\,\theta = \frac{3}{4}$ *and* $sin\,\theta < 0$, what is $cos\,\theta$?

A) $\frac{4}{5}$ B) $\frac{3}{5}$ C) $-\frac{3}{5}$ D) $-\frac{4}{3}$ E) Answer not given.

Continued on next page.

4 What is the range of the following function?



A) $(-\infty, 10]$
B) $(-\infty, 2] \cup (5, 10]$
C) $(-\infty, -4] \cup [-1, 8)$
D) $(-\infty, 8)$
E) Answer not given.

5 What is the equation of the line that is the perpendicular bisector of the line segment whose endpoints are (9, 1) and (-1, 5)?

A) $y = \frac{5}{2}x - 7$ B) $y = \frac{2}{5}x + 2$ C) $y = -\frac{2}{5}x - 4$ D) $y = \frac{5}{2}x - 4$
E) Answer not given.

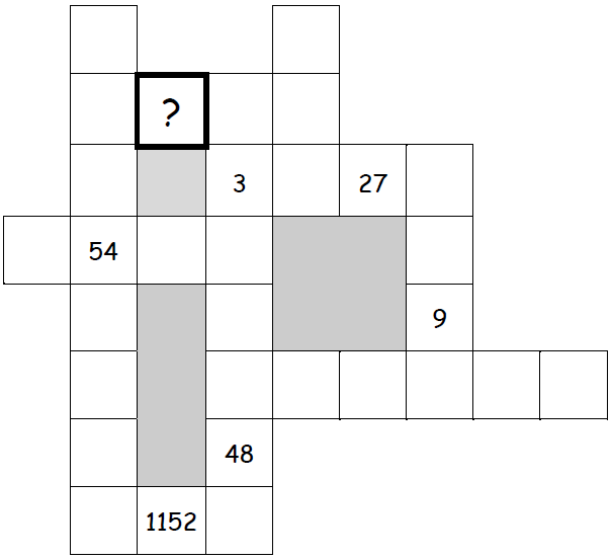
6 Gregg rolls a standard 6-sided die until he rolls a 6. What is the probability that he rolled the die exactly 'n' times?

A) $\frac{1}{n}$ B) $\frac{1}{6}$ C) $\frac{n \cdot 5^{n-1}}{6^n}$ D) $\frac{5^{n-1}}{6^n}$ E) $\frac{5^n}{6^n}$

7 The local time in Auckland, New Zealand is 19 hours ahead of the local time in Seattle, WA. In other words, it is 19 hours later in Auckland compared to Seattle. Suppose you are visiting friends in Auckland, and want to call your family in Seattle at 8 p.m. Seattle time. What time should it be in Auckland when you call?

A) 1 a.m. B) 9 a.m. C) 1 p.m. D) 3 p.m. E) Answer not given.

Continued on next page.

8	Each row and column in the following puzzle contains a geometric sequence, with the progression going either up, down, left or right. What number belongs in the box with the question mark?  A) $\frac{27}{2}$ B) $\frac{9}{2}$ C) $\frac{9}{4}$ D) 1 E) Answer not given
9	What is the area of a triangle with side lengths 2, $\sqrt{2}, and\ \sqrt{3}-1$? A) $\frac{\sqrt{3}-1}{2}$ B) 1 C) $\frac{\sqrt{3}+1}{2}$ D) $\sqrt{2}$ E) $2\sqrt{2}$
10	An urn contains 4 silver coins and 3 gold coins. If the coins are drawn one-by-one, without replacement, what is the probability that the 5th coin drawn is silver? A) $\frac{5}{14}$ B) $\frac{3}{7}$ C) $\frac{1}{2}$ D) $\frac{9}{14}$ E) $\frac{4}{7}$

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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	C
2	D
3	E (-4/5)
4	C
5	A
6	D
7	D
8	C
9	A
10	E

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

Final Score *(out of 20)*

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

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

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.

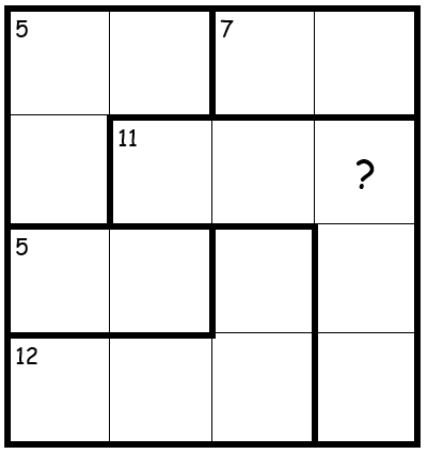
STUDENTS: DO NOT WRITE IN SHADED REGIONS

	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 — 2024-25

11/12th Grade — October, 2024

Team Contest

1	Packard's pet rabbit, Kirby, jumps 15 centimeters with each jump. Kirby is currently 2024 centimeters away from Packard, and jumps directly towards Packard on a straight line. How many jumps will it take Kirby to reach Packard? Assume that on the last jump, Kirby can jump exactly the remaining distance needed, if it is less than 15 cm.
2	Triangle ABC has vertices A (0, 0), B (30, 0) and C (0, 15) on the coordinate plane. Point D, which lies on BC, is the foot of the angle bisector from A to BC. The coordinates of point D are (x, y). What is x + y?
3	How many perfect squares are divisors of 2025?
4	Let A = {1, 2, 3, 4, 5} and B = {15, 16, 17, 18, 19}. One number is randomly selected from set A, and one number is randomly selected from set B. As a percentage, what is the probability that dividing the number from B by the number from A (B/A) results in an integer?
5	Evaluate: $25^{\log_5 6}$
6	How many polynomials are there of the following form, such that c and d are real numbers, and the three roots of the polynomial are distinct positive integers? $x^3 - 8x^2 + cx + d$
7	How many positive 4-digit integers have three of the same digit and a different fourth digit (in any order)?
8	In the following grid, the integers 1, 2, 3 and 4 appear exactly once in each row and each column. The sum of the integers in each heavily outlined region is equal to the number given in the upper left corner of the region. What number goes in the square with the question mark? 

Continued on next page.

9	The number 89 can be represented as the product plus the sum of the same two positive integers, as follows: $$89 = (5 \times 14) + (5 + 14)$$ What is the smallest integer greater than 89 that cannot be represented in this manner?
10	For a real number x, the floor function $\lfloor x \rfloor$ is defined as the greatest integer less than or equal to x. Evaluate the following: $$\sum_{n=1}^{100} \lfloor log_2 n \rfloor$$

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

Key

Team Contest – Answer Key

11/12th Grade

	Answer
1	135 [jumps]
2	20 [= x + y]
3	6 [perfect squares]
4	44 [%]
5	36
6	2 [polynomials]
7	324 [4-digit integers]
8	4
9	96
10	480

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

Final Score *(out of 10)*

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

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

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 — 2024-25

11/12th Grade — October, 2024

Pressure Round Contest

1	Sahil and Mir are solving a math problem which asks for the sum of the first ten powers of 2. Sahil assumes this means the powers of 2 starting with $2^0 = 1$, and Mir assumes that it means the powers of 2 starting with $2^1 = 2$. Let 'a' equal the positive difference of their answers, and let 'b' equal Mir's answer divided by Sahil's answer. What is a + b?
2	Solve for x: $2^{38} + 4^{19} + 8^{13} = 16^x$
3	A 2-digit positive integer is randomly chosen. As a percentage, what is the probability that the product of the digits in the number is a positive multiple of 3?
4	How many integers x satisfy the following inequality? $\lvert x + 10\rvert > \lvert 2x + 1\rvert$
5	Evaluate: $9^5 + 9^4 + 9^3 + 9^2 + 9$

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

Final Score *(out of 15)*

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

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"Math Is Cool" Championships — 2024-25

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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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

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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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

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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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

11/12th Grade — October, 2024

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.

"Math Is Cool" Championships — 2024-25

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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 forty-one thousand seven hundred twenty minus eighteen thousand four hundred twenty?	
2	How many integers 'x' satisfy the following equation: The absolute value of 'x' is less than pi	
3	If a, b and c are positive consecutive even integers, with c greater than b greater than a, what is the value of b-squared minus 'ac'?	
4	The sides of a triangle are eleven, sixty and sixty-one inches. In square inches, what is the area of the triangle?	
5	What number is one-third of the way from negative four to seventy-one, and closer to negative four?	
6	Two students working at a constant rate can paint one classroom in five hours. How many minutes would it take three students working at the same constant rate to paint two classrooms?	
7	Amy's average on her six math tests this semester is seventy-five points. Fortunately, her teacher drops each student's lowest grade, which raises Amy's average to eight-five. What was her lowest test grade, in points?	
8	A palindrome is a number that reads the same forwards and backwards, like one hundred twenty-one. How many five-digit palindromes are there that do not include the digit nine?	

"Math Is Cool" Championships — 2024-25

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Key

Pressure Round Contest – Answer Key

11/12th Grade

	Answer
1	1025 [= a + b]
2	10 [= x]
3	50 [%]
4	12 [integers]
5	66429

"Math Is Cool" Championships — 2024-25

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Key

COLLEGE BOWL ROUND #1

#	Problem	Answer
1	Solve for x: Negative two over seventeen equals 'x' over thirty-four	-4 [=x]
2	The hypotenuse of a right triangle with integer side lengths is thirteen units. In square units, what is the area of the triangle?	30 [square units]
3	For which positive integer 'n' does four hundred squared times four hundred squared equal sixteen squared times n-squared?	10000 [= n] [ten thousand]
4	Quinn has 'n' pieces of candy that she is trying to split between five people equally. However, after splitting them into five equal piles, two pieces are left over. If Quinn has between five and one hundred pieces of candy, how many possible values of 'n' are there?	19 [values of n]
5	How many even three digit positive integers are there?	450 [even three digit positive integers)
6	A soccer ball is dropped from a height of ten meters, and each time it bounces it goes up to one-third of its previous height. How many meters does the ball travel in total before coming to rest?	20 [m]
7	Leon has five black shirts, seven green shirts and eight yellow shirts. He also has four pairs of black pants and six pairs of khaki pants. If he randomly chooses one shirt and one pair of pants, what is the probability in percent that they are both black?	10 [%]
8	What is the sum of all values of 'x' that satisfy the following equation: x squared minus ten equals three 'x'	3 [= sum]
9	Rectangles A and B are similar, with a side length of two point one units on rectangle B corresponding to a side length of twenty-one units on rectangle A. What is the area of rectangle A in square units, if the area of rectangle B is three point three six square units?	336 [square units]
10	Julio lives one mile away from his school, and walks at a constant rate of three miles per hour. How many minutes will it take him to walk to school and then back home?	40 [minutes]

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Key

COLLEGE BOWL ROUND #2

#	Problem	Answer
1	What is the largest real number x that satisfies the inequality: two 'x' plus three is greater than or equal to four 'x' plus nine	-3 [= x]
2	How many hours are in the months of October and November combined?	1464 [hours]
3	In an arithmetic (pronounced air-ith-MET-ic) sequence, the first term is twenty-three and the seventh term is forty-seven. What is the value of the common difference, 'd'?	4 [= d]
4	Diego is throwing a party for at least four other friends and buys a bag of five hundred forty-six pieces of candy. He distributes all of the candy, with each person including himself getting an equal number of pieces. If the number of people present is odd, what is the smallest number of people that could be present?	7 [people]
5	In a class of seventeen students, eight have a cat, seven have a dog, and three have both a cat and a dog. What is the probability as a percent that a student has a cat, given that they do not have a dog?	50 [%]
6	Four friends each picked a different non-prime positive integer. The greatest common factor of each pair of integers was one. What is the least possible sum of the four integers?	39 [= least possible sum]
7	How many positive five digit palindromes are there, where a palindrome is a number that reads the same forwards and backwards?	900 [5-digit palindromes]
8	If the quantity 'x' minus one times the quantity 'y' minus one equals two thousand twenty-four, what is the value of quantity one minus 'x' times the quantity one minus 'y'?	2024
9	ABCD is a square with side length 10 units, and point P lies on side AB. In square units, what is the area of triangle PCD?	50 [square units]
10	If five cows can produce five gallons of milk in five days, how many days will it take six cows to produce six gallons of milk?	5 [days]

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Key

COLLEGE BOWL ROUND #3

#	Problem	Answer
1	How many integer values of 'x', where 'x' is from zero to seven inclusive, satisfy the following inequality: negative two 'x' plus four is greater than or equal to one	2 [values of x]
2	As an integer, what is two times ten to the negative six divided by four times ten to the negative eleven?	50000 [= fifty thousand]
3	What is the positive difference between the median and mean of the following data set: Five, fifty, forty-six, thirty, ten, twenty-nine, thirty-three	1 [= positive difference]
4	How many positive divisors does seven hundred twenty-nine have?	7 [positive divisors]
5	How many minutes does it take a clock's hour hand to move through one degree of arc around the clock face?	2 [minutes]
6	Zeno is forty meters from his car, and every minute he walks half the remaining distance to the car. During the first minute he walks twenty meters towards the car. During the second minute he walks ten meters towards the car. How many millimeters does he walk during the fifth minute?	1250 [mm]
7	A jar is filled with red, white and blue marbles. If one marble is selected at random, the probability that it is red is one-fourth, and the probability that it is white is two-fifths. As a percentage, what is the probability that it is blue?	35 [%]
8	You are going to buy either one hundred hot dogs or sixty hamburgers for a group of 'n' people, including yourself. With either choice, the items can be distributed equally between the 'n' people. What is the largest possible value of n?	20 [= n, = no. of people]
9	A cone has a diameter of four units and a volume of eight pi cubic units. A cone that is similar to this one has a diameter of eight units and a volume of A times pi cubic units. What is A?	64 [= A]
10	For what integer 'n' are the roots of the following equation consecutive integers? x-squared minus 7x plus 'n' equals 0	12 [= n]

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Key

COLLEGE BOWL ROUND #4

#	Problem	Answer
1	How many distinct prime factors does eighty-four have?	3 [unique prime factors]
2	What is two raised to the sixth power minus two raised to the fourth power?	48
3	Find the next term in the sequence that begins: one, sixteen, two hundred fifty-six, four thousand ninety-six, and so on.	65,536
4	Let f of 'x' equal 'x' to the fourth minus seven 'x' to the third minus three 'x' plus ten. How many negative numbers 'a' are there such that f of 'a' equals zero?	0
5	Three circles with radii of one, two and three units are each externally tangent to the other two. A triangle is formed by joining the three centers of the circles. What is the area of the triangle, in square units?	6 [square units]
6	There are one hundred students at a school, each of whom takes at least a math or an art class. Seventy of the students take a math class, and thirty students take both a math and an art class. How many students take a math class but not an art class?	40 [students]
7	The length of a rectangle is two times its width. When its length is decreased by four units and its width is increased by six units, a new rectangle with the same area is created. In units, what is the perimeter of the new rectangle?	22 [units]
8	A technical college has four thousand students in their freshman class, and three thousand three hundred and twenty of them are majoring in a STEM-related field. What percent of freshmen are majoring in a STEM-related field?	83 [%]
9	In square centimeters, what is the maximum possible area of a rectangle with a perimeter of twelve centimeters?	9 [square cm]
10	The following two lines intersect at the point 'x' comma 'y'. What is 'x' times 'y'? three 'x' plus three 'y' equals fifteen two 'x' plus six 'y' equals twenty-two	6 [= x times y]

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Key

COLLEGE BOWL ROUND #5

#	Problem	Answer
1	At Wolffy's Hamburgers, your check comes to fifty-six dollars, and you leave a fifteen percent tip. In cents, how much total money do you pay?	6440 [cents]
2	What is the smallest three-digit positive integer that can be written as the product of two consecutive positive integers?	110
3	On the coordinate plane, the distance between the points negative four comma zero and negative two comma negative six can be written in simplest radical form as A times the square root of B. What is A plus B?	12 [= A + B]
4	A, b, c and d are four numbers, with a less than b and c less than d. The average of a and b is c. The average of c and d is b. If d minus a equals sixty, what is the value of b minus c?	20 [= b – c]
5	In square units, what is the area of a triangle with side lengths of thirteen, fourteen and fifteen units?	84 [square units]
6	In a sequence with a first term of five, each succeeding term is the sum of the digits of the square of the previous term. For example, five squared equals twenty-five, and two plus five equals seven which is the second term. What is the tenth term in the sequence?	16 [= 10th term]
7	If a fair coin is flipped ten times, what is the probability in percent of getting an odd number of heads?	50 [%]
8	On the coordinate plane, points A, B and C are at one comma one, five comma negative two, and one comma negative 2. In units, what is the perimeter of triangle ABC?	12 [units]
9	A square piece of paper is folded in half horizontally to form a rectangle. The rectangle has a perimeter of eighteen inches. In inches, what is the perimeter of the original square?	24 [inches]
10	If x-squared plus four 'x' plus five equals zero, what is the value of ten x-squared plus forty 'x'?	-50

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Key

COLLEGE BOWL ROUND #6

#	Problem	Answer
1	What is one thousand two hundred thirty-seven point seven eight five rounded to the nearest hundred?	1200 [12 hundred]
2	What is two thousand minus 'x' to the fourth, when 'x' equals five?	1375
3	On the coordinate plane, point A is at two comma five and point B is at three comma four. If point C is co-linear with points A and B, and lies on the x-axis, what is the x-coordinate of point C?	7 [= x-coordinate of point C]
4	The greatest common divisor of 'x' squared plus fifty and four 'x' plus two is six. What is the smallest positive integer that 'x' could be?	4 [= x]
5	Jimmy and Seth are playing a best-of-five card game series, where the first player to win three games wins the series, and there are no ties. If the series lasts five games, with Seth winning, in how many different orders could the outcomes of the games have gone?	6 [orders]
6	In a sequence that begins with one, three, two, and so on, each term starting with the third term is equal to the term preceding it minus the term preceding that one. What is the tenth term in the sequence?	-1 [= 10th term]
7	Apple tells the truth sixty percent of the time and Bailey tells the truth seventy percent of the time, independently of each other. It is true that they are both sixteen years old. They are each asked: are you sixteen years old? As a percent, what is the probability that they give different answers?	46 [%]
8	For what positive integer 'n' are both 'n' and n-squared plus two prime?	3 [= n]
9	What is the volume, in cubic meters, of a cylinder with a height of eighty over pi meters, and a base radius of fifty centimeters?	20 [cubic meters]
10	Solve for x: Negative four over three plus the quantity 3x plus seven over twelve equals 1	7 [= x]

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Key

COLLEGE BOWL — EXTRA Questions

#	Problem	Answer
1	A car drives six hundred thirty miles on thirty-five gallons of gas. How many miles can it drive on twelve gallons of gas?	216 [miles]
2	Three friends spent a combined total of one hundred twelve dollars at the county fair. Ross spent half the amount Joey spent, and Chandler spent ten dollars more than Ross spent. How many dollars did Joey spend?	51 [$]
3	The line 3x plus four equals y is reflected over the y-axis to the line ax plus b equals y. What is the sum of a and b?	1 [= a + b]
4	Anita rolls two fair n-sided dice, where n is greater than five. What is n, if the most probable sum of the numbers obtained is seventeen?	16 [= n]
5	There are fifty unpaired socks in a sock drawer. Fifteen are pink, fifteen are purple, and the rest are yellow. How many socks do you have to take out of the drawer to have guaranteed that at least one sock of each color was taken out?	36 [socks]
6	The number zero point three seven five can be expressed as a fraction n over d, where n and d are relatively prime integers. What is n plus d?	11 [= n + d]

Proctoring Overview

You will receive a room packet envelope with the schedule and College Bowl rotations on the front. Each room packet includes:

1) the proctor instructions and the general instructions that you will be reading,
2) the proctor question/answers packet (this needs to be carefully controlled), and
3) sets of Mental Math, Individual, Multiple Choice, Team, and Pressure Round tests. (If not in the room packet, the proctor supervisor will provide blank scratch paper.)

When you receive the room packet, count to ensure that you have the correct number of tests for each event (16 Mental Math & Individual, 4 of each of the team events).

Key Points

- Act professional; focus on what you are doing.
- Your job is to proctor the students; that is, you administer tests, give time warnings, & monitor students for proper test taking behavior to ensure competition integrity and avoid issues like failing to put answers on the answer sheet.
- The proctor packet has Mental Math, Pressure Round, and College Bowl questions/ answers. Keep the packet secure! Avoid opportunities for competitors to see tests or answers.
- Student/school names and team numbers are critical on the answer sheets. Make sure that students fill out such identifying information.
- Keep track of time, and provide appropriate time warnings. Keep to the schedule as close as possible. Wait between events, if needed.
- Read & know the rules—competitors & spectators will, and they will call you on it.
- On questions that you read, read smoothly, enunciate clearly, and don't read too fast.
- If unsure of how to deal with an issue/question/concern, flag down the proctor supervisor and ask.
- Be respectful of your classroom — leave it tidy and arranged exactly as you found it. We don't want any displeased teachers!!
- Use the quick-reference guide on the next page for room setup and key information.

Schedule

Each of the 6 events includes about 5 minutes at the start for reading instructions or rearranging the room.

3:30 - 4:00	Coaches register (Library)	6:10 - 6:40	Proctors get dinner in proctor room
4:05 - 4:15	Orientation (Gym)	6:45 - 6:55	College Bowl #1
4:15 - 4:20	Students go to testing rooms	6:55 - 7:05	College Bowl #2
4:20 - 4:35	Mental Math	7:05 - 7:15	College Bowl #3
4:35 - 5:15	Individual Test	7:15 - 7:25	College Bowl #4
5:15 - 5:35	Individual M.C. Test	7:25 - 7:35	College Bowl #5
5:35 - 5:55	Team Test	7:35 - 7:45	College Bowl #6
5:55 - 6:10	Pressure Round	8:00 - 8:30	Awards Ceremony (Gym)

1. Mental Math

Configuration: Students at individual desks spread out in the classroom. Alternating desks, students not next to teammates.

Scheduled Time: 4:20-4:35 PM (read instructions & test)

Duration: 30 seconds per question maximum (beginning after the 2nd reading)

Give Time warning at: 5 seconds

Number of questions: 8 (all students do the same questions)

Proctor Actions: Read each question twice, reading clearly and not too fast. Start the 30 second clock after the 2nd reading.

Key Points: Start by reading "General Instructions" then Mental Math instructions. Make sure everyone writes their name, school & team number on the answer sheet. No talking allowed. Except for the answer, no is writing allowed. Collect answer sheets and organize by team number, then alphabetically by first name of competitor, & staple sheets for the same team together.

2. Individual Test

Configuration: Students at individual desks; same arrangement as for Mental Math.

Scheduled Time: 4:35 PM (read instructions), 4:40-5:15 (test)

Duration: 35 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 40

Proctor Actions: Ensure appropriate test-taking behavior. Prep for next event (or read College Bowl questions to yourself).

Key Points: Read "Individual Test" instructions. Make sure everyone writes their name, team number, school, proctor name, & room number down on the answer sheet. Collect answer sheets, organize by team, then alphabetically by first name of competitor, and staple sheets for same team together.

3. Individual Multiple Choice Test

Configuration: Students at individual desks; same arrangement as for the Individ. Test.

Scheduled Time: 5:15 PM (read instructions), 5:20-5:35 PM (test)

Duration: 15 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 10

Proctor Actions: Ensure appropriate test-taking behavior. Prepare for next event.

Key Points: Read Multiple Choice instructions. This is an individual test.

4. Team Test

Configuration: Groups of 4 desks, with the groups spread out in the classroom.

Scheduled Time: 5:35 PM (read instructions), 5:40-5:55 PM (test)

Duration: 15 minutes

Give Time warning at: 5 minutes & 30 seconds

Number of questions: 10

Proctor Actions: Ensure appropriate test-taking behavior. Prepare for next event.

Key Points: Read Team Test instructions. Need to have school & team number on answer sheet. Students can talk quietly & work together.

5. Pressure Round

Configuration: Groups of 4 desks spread out in the classroom (same as Team Test).

Scheduled Time: 5:55 PM (read instructions), 6:00-6:10 PM (test)

Duration: 10 minutes (2 minutes per question)

Give Time warning at: 5 seconds before end of each 2-minutes

Number of questions: 5 (can submit answers in any order)

Proctor Actions: Ensure appropriate test-taking behavior. Score submittals as you go (without showing any answers to students).

Key Points: Students can talk quietly & work together. Proctor: keep answer sheets in order of submittal; make sure that you score the right question and give the right point value.

6. College Bowl

Configuration: Row of 9 desks (side by side) at the front of the room (CBA device on center desk).

Scheduled Time: 6:45 PM (read instructions), 6:50-7:45 PM (test)

Duration: 45 seconds per question (30 seconds per question if there is only one team, who will be only going against the clock)

Give Time warning at: 5 seconds

Number of questions: 10 per round, 6 rounds total

Proctor Actions: Read each question twice, reading clearly and not too fast. Start 45 (or 30) second clock after the 2nd full reading. Mark tally on white board as questions are answered and transfer the numeric total to the score sheets.

Key Points: Event is collaborative, talking is allowed. For a wrong answer, just say, "That is incorrect." (no verbal/visual clues that could be interpreted by the other team to arrive at an answer).

Summary of MIC Proctoring

(for proctors to read to themselves)

Pass out materials (answer sheet/test packets, scratch paper) for the current event to individuals or teams (as appropriate) so they can fill in the name, school, and team number information (very important!). Tell students to not lift the cover sheet or turn over the paper until you give the signal to start. Read the general instructions as the first item at the beginning of the competition (before Mental Math). Read the event-specific instructions just prior to each event and ask if there are any relevant questions. After reading the instructions, you can signal students to begin. Make sure one proctor is watching the time and giving appropriate time warnings (e.g., "five minutes remaining"). At the end of the event, tell competitors to stop work. Collect, sort, & staple the answer sheets (as appropriate) and keep them secure until handed off to a runner.

For the Mental Math/Individual tests, arrange students scattered throughout the classroom with **no student next to another student from their own school**. For the team tests, students will be in groups of 4 desks. College Bowl will require a line of 9 desks side-by-side across the front of the classroom.

For College Bowl, place the College Bowl apparatus (CBA) on a central desk in the line of desks at the front (4 desks on either side of the central one). One proctor will likely need to hold the CBA in place during the College Bowl rounds. Turn the apparatus on by depressing the button or flipping the dip switch. Students may try out the CBA prior to the 1st question. Note: while one light is blinking, the other light is locked out. There is no need to "reset" the device, just let the light finish blinking and it is ready to go.

Keep Pressure Round answers secure while you score the submittals because answers for all questions are on the same sheet. Do not read the answer for College Bowl when you read the question (they are both on the same page). In College Bowl, if an incorrect answer is given, simply say "That is incorrect" and do not give any other cues about the answer (e.g., don't say "sorry, you were close" or exhibit interpretable body language). If both teams fail to supply a correct answer, announce what the correct answer was.

If there is an irregularity (i.e., lack of honesty, poor sportsmanship), make a note of the circumstances, flag the answer sheet, and report the issue to the proctor supervisor.

At the end of the day, return the desks to their original arrangement, recycle any unwanted test materials & used scratch paper, erase any marks you made on the whiteboard, and generally make sure the classroom is tidied up. Return the CBA, the room packet envelope, the proctor instructions, the contest rules packet, the proctor packet of questions, extra scratch paper, and unused test material to the proctor supervisor.

Detailed Instructions for Proctors

Grades 9-12

NO CALCULATORS ALLOWED ON ANY TESTS!

1. Check to make sure you have everything in your packet.
   - A. ***Mental Math:***
     1. 16 - colored Mental Math answer sheets
     2. Mental Math questions with answers (in the Proctor Packet)
   - B. ***Individual Test:*** 16 individual tests, with colored answer sheets attached
   - C. ***Individual Multiple Choice Test:*** 16 individual multiple choice packets (stapled), with a colored answer sheet on top
   - D. ***Team Test:*** 4 team test packets (stapled), each containing 4 tests plus one colored answer sheet on top
   - E. ***Pressure Round:***
     1. 4 - blank answer sheet packets (with cover sheet/instructions)
     2. 4 – Pressure Round test sets
     3. Pressure Round Answer Key (in the Proctor Packet)
   - F. **College Bowl:**
     1. 4 - College Bowl score sheets
     2. College Bowl questions – 6 rounds (in the Proctor Packet)
   - G. Scratch paper (to be handed out as needed, but try not to waste it)
   - H. Electronic College Bowl Apparatus (CBA; usually distributed at dinner break)

   ALL *COLORED* ANSWER SHEETS WILL BE COLLECTED BY YOU AND WILL BE TAKEN TO THE SCORING ROOM (by RUNNERS) AS SOON AS THEY ARE FILLED OUT BY COMPETITORS (AND PERHAPS GRADED BY YOU). COMPETITORS CAN KEEP ALL OF THE WHITE SHEETS, IF THEY WOULD LIKE (OTHERWISE COLLECT THEM FOR RECYCLE).

   If you are missing anything, you can go get it before the opening ceremony. After the opening ceremony, contact the proctor supervisor/scoring room.

2. Take a photo of how the classroom is laid out (so that it can be returned to its original configuration following the competition). Then set up the classroom desks for the first event (Mental Math).

Respect the teacher whose room you are using. Do not touch their computer or other items. Do not erase anything on their board. Leave the room tidy & in the exact original layout.

Mental Math

3. Arrange desks in a configuration suitable for individual testing (rows/grid of desks all facing forward, students in separated/alternating desks).

4. Put the Mental Math answer sheets face up on the desks such that students are spread out. Wait for students to arrive. ~~You can fill out the proctor name and room number (and perhaps team numbers) on all blank answer sheets, if you like~~. Read over the questions so you will be prepared to read them out loud.

5. After students sit down, check to make sure that no one from the same team is seated next to each other (i.e., "Team xxx, raise your hands."). Ask them to move, if needed.

6. **Check to make sure that students put their full name, school name, team number, and room number on their answer sheet and that the information is legible**.

7. Read the "GENERAL INSTRUCTIONS" (in the Proctor Packet) to the students. Then, read the "MENTAL MATH" instructions (in the Proctor Packet) to the students.

8. Begin the testing. Read each of the eight Mental Math questions to all of the students in the room, per the instructions.

9. At the conclusion of Mental Math, collect the answer sheets. Organize the answer sheets by team number, then alphabetically by first name of competitor. Staple each team's set of four answer sheets together. Promptly hand the packets of answer sheets to your runner for conveyance to the scoring room.

Individual Test

10. The seating configuration will remain unchanged (no swapping seats).

11. Hand out Individual Test packets with the colored blank answer sheet facing up. **Check to make sure that students put their full name, school name, team number, and room number on their answer sheet and that the information is legible**.

12. Read the "INDIVIDUAL TEST" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.

13. While students are taking the Individual Test, monitor the students for proper test-taking behavior and watch the time to provide 5-minute and 30-second warnings. Make sure students are writing answers on the answer sheet (not the test question pages). During this time you can also get the Individual Multiple Choice tests ready, read through the rules of subsequent events, and (carefully/secretively) look ahead to review the College Bowl questions (i.e., to avoid stumbling over the wording when it comes time to read the questions aloud). You will have observers in the room watching the College Bowl rounds, so make sure you understand the rules, how timing works, etc.

14. At the conclusion of Individual Test, collect the answer sheets. Organize the answer sheets by team number, then alphabetically by first name of competitor. Staple each team's set of four answer sheets together. Promptly hand the packets of answer sheets to your runner for conveyance to the scoring room. Students may keep or recycle their test question packets.

Individual Multiple Choice

15. Keep the room in the same configuration as for the Individual Test.
16. Hand out the tests and have students fill out the top portion of the answer sheet. **Check answer sheets to make sure they are filled out correctly (school, team #, etc.).**
17. Read the "INDIVIDUAL MULTIPLE CHOICE" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.
18. Monitor the students for proper test-taking behavior (no talking permitted), watch the time, and provide 5-minute and 30-second warnings. While students are taking the Individual Multiple Choice test, get the Team Tests ready.
19. At the conclusion of the test, collect the answer sheets. Organize the answer sheets by team number, then alphabetically by first name of competitor, with the set of team answer sheets stapled together. Hand the answer sheets off to the runner.

Team Test

20. Change the room set-up to groups of 4 desks together so students can work as a team. Hand out the Team Test packets and have teams fill out the information at the top of the colored answer sheet. **Check the answer sheets to make sure they are filled out correctly (school, team #, etc.).**
21. Read the "TEAM TEST" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.
22. Monitor the students for proper test-taking behavior (talking is allowed), watch the time, and provide 5-minute and 30-second warnings. While students are taking the Team Test, get the Pressure Round tests ready.
23. At the conclusion of the test, collect the answer sheets & hand them off to the runner.

Pressure Round

24. Leave the desks in the same arrangement as the team test. Make sure that all teams can quickly and easily hand you their answer sheet every two minutes.
25. Hand out the colored half-sheet packets to each team so they can fill out their school name and team number on each sheet before testing begins.
26. Have each team tear off the first sheet and give it to you to keep score.

27. YOU WILL BE TIMING THIS EVENT FOR YOURSELF. GIVE THEM A VERBAL 5 SECOND WARNING AND TELL THEM TO HOLD THEIR ANSWER SHEETS UP IN THE AIR EVERY TWO MINUTES. Tell them when the time is up for each two-minute round and, if an answer sheet isn't up in the air all the way at this time, then collect, but score as a zero and just write "time" on the score sheet for that particular question.

28. While they are working on the next round, you need to grade the answer sheets that you just collected and score it on the score sheet. Stack each team's half-sheets in **the order that they were turned in**, keeping the score sheet on top. Remember, you are still timing while you are doing all this!

29. Read the "PRESSURE ROUND" instructions (in the Proctor Packet) to the students and begin the testing at the appointed time.

30. At the conclusion of the fifth round, staple each team's half-sheets together, with the score sheet on top. Wait for the runner to come pick up the four packets before leaving for break.

Dinner Break

31. AT BREAK — Eat dinner in the proctor room. Pick up your College Bowl apparatus (CBA) at this time. If you haven't already, you may want to read over the College Bowl questions to make sure you will be able to pronounce everything properly. Return to your room in time to place the CBA in position.

College Bowl Rounds

32. Place the CBA on the middle desk of the line at the front of the room (you may want to moisten the suction cups with a film of water). One proctor may need to hold the device down (and do timing). Do not press the button to "reset" the CBA (it's an on/off switch).

33. You will have the same teams that were previously in the room for the duration of all College Bowl rounds — if you have an extra/different team, they are in the wrong room and can be disqualified if they hear the questions! Help get them to the correct room.

34. Fill out the score sheets for each team in your room with their school name and team number. Call up the first 2 teams according to the sequence on the room envelope.

35. You will be reading Round #1 questions to two teams while the other two teams (and any spectators) wait in the back of the room out of line of sight of the competitors. Refer to the College Bowl schedule (on your room envelope) to see which two teams compete in each round. If a round only has one team, they will be competing against the clock and thus will have 30 seconds to answer, not 45 seconds. Record the final scores for each team on their score sheets (which you hold on to) after each round. Rounds 2-6 work the same way. Refer to the schedule to make sure the correct

teams are competing at the correct time. Don't get ahead of schedule (or behind, for that matter!). If you finish a round early, please wait until the appointed time to start the next round. If you have any problems (including anyone questioning the rules or a decision made by a proctor) contact the proctor supervisor.

36. Who is keeping score? Who is keeping track of the time? YOU ARE !!!
37. Read the "COLLEGE BOWL" instructions (in the Proctor Packet) to all the students (just one time), then begin the testing for each round at the appointed times.
38. If you mis-read a question, replace it with one of the extra questions.
39. If a parent/coach/student protests an answer, make a note of the situation (the test, the problem number, who answered, what their answer was, etc.) and kindly state that the coach should bring up the issue with the contest director. Proceed as normal, scoring the question based on the answer key.
40. At the conclusion of all College Bowl rounds, get the score sheets promptly to the scoring room (either yourself or via a runner).
41. Release your group to the awards ceremony no earlier than 7:45 PM to avoid causing a disruption to other rooms. Have students help re-set the room.
42. At the end of the day, return the desks to their original arrangement, collect all scratch paper, erase any marks you made on the whiteboard, and generally make sure the classroom is tidied up. Return the College Bowl apparatus, proctoring envelope, and residual material to the proctor supervisor.

General Instructions

- 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 will be an integer, with the exception of the Multiple Choice test.
  - ~~Express all rational, non-integer answers as common fractions, except in problems dealing with money, where you should give the answer as a decimal rounded to the nearest cent.~~
  - ~~For fifth grade and up, 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, ~~unless it is a problem that deals with time, in which case, AM or PM is required~~. However, if you choose to 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.

Mental Math Instructions

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.

Individual Test Instructions

You will have 35 minutes to work on the Individual test, which consists of 40 questions. When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The first 30 questions are worth two points each and questions 31-40 are worth 3 points each. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute warning.

Individual Multiple Choice Instructions

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.**

Team Test Instructions

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.

Pressure Round Instructions

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. The problems need not be submitted in order; you can submit an answer for any of the problems, and your answer can be a guess, if you like. The maximum value of this first submitted answer is 1 point.

In another two minutes, you are expected to submit another answer to any one of the four remaining problems (you cannot submit a new answer for a previously submitted problem). The maximum value is two points for this second submittal.

This process will continue until all of the problems are answered. Each consecutive submitted answer increases in score value 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 prior to the end of each two-minute period. You will be told to hold your answer sheet up in the air for the proctor to collect. You may keep working as the answer 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.

College Bowl Instructions

Read these to the competitors before the first round:

To maintain the integrity of the competition, spectators must stay in this room during a round of College Bowl questions. Once all readings for a round have been completed, you may leave.

All competitors must be facing the front of the room in one row. Teams not competing in the current round need to be behind the front row and in front of the spectators. All spectators need to be behind the competitors at the back of the room.

A maximum of ten questions per round will be scored. It is OK for both teams to score the same number of points! The proctor will record the points earned on each team's score sheet, which is retained by the proctor.

You may use scratch paper and pencil. You may talk with your team members while arriving at a solution.

An Electronic College Bowl Apparatus (CBA) will be used to identify the team who is first to have an answer.

During these rounds, each question will be read twice and a maximum time of 45 seconds after the second reading of the question is completed will be allowed for a team to answer. If a team buzzes in after the second reading and gives an incorrect response, the other team has the remainder of the 45 seconds to respond. A team is allowed only one attempt at buzzing in and answering per question. You may interrupt (buzz in) while a question is being read, however, if you do, the proctor will stop reading, and an immediate response is needed. If the correct response is given, the proctor will proceed to the next question. Otherwise, the question will be re-read for the other team, making sure it has two full readings. If an immediate response is not given after a team buzzes in, their lack of an answer in a timely manner is considered incorrect. In the event that only one team is competing in a round (i.e., one team is absent), the team competing will have a maximum of 30 seconds after the completion of the second reading in which to buzz in. The proctor will give a 5-second time warning.

Wait to be acknowledged by the proctor before giving an answer. This avoids the situation of blurting out an answer when the other team buzzed in first.

If two students from the same team answer at the same time with different answers, the answer will be considered incorrect.

If a problem arises with one of the questions, an extra question will be asked to replace that question.

If the round finishes early, you need to stay in the room for the remaining time.

Mental Math Questions

Pressure Round Answers

College Bowl Questions/Answers