"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

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			
5th Grade	TOTAL:		

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

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.

5th Grade

	Answer	
1	54	What is the product of nine and six?
2	20 [units]	What is the perimeter of a square with side length five?
3	18	What is the next number in the arithmetic sequence that begins: two, six, ten, and fourteen?
4	32 [cowboys]	If it takes eight cowboys to lasso three bulls, how many cowboys does it take to lasso twelve bulls?
5	20 [minutes]	How many MINUTES will it take me to bike five miles if I am biking at a speed of fifteen miles per hour?
6	3 [dollars]	Kirby spent three times as much on a hamburger than his soda. If Kirby spent twelve dollars in all, how much did Kirby's soda cost, in dollars?
7	Monday	If today is Friday, then what day will it be one hundred fifty-seven days from now?
8	5	What is the smallest positive whole number by which the number twenty can be multiplied to obtain a perfect square number?

"Math Is Cool" Championships — 2019-20

5th Grade — February 28, 2020

Individual Contest

Record all answers on the colored cover sheet. 35 minutes, 40 problems, ~92% of individual score.
No talking during this individual test. A 5-minute time warning will be given.

	Questions 1-30: 2 points each
1	What is the smallest number in the following list: 122, 72, 132, 85, and 69?
2	Emma has $4.38 and her sister has $5.32. How much do they have together, in dollars?
3	What is the quotient of 54 and 9?
4	What is 3897 – 2647 ?
5	Yosh eats 3 vitamins every day. How many vitamins will Yosh eat in a week?
6	Calculate: 32.034 – 3.545 and write your answer as a decimal to the nearest thousandth.
7	Write out this number numerically: three million, seven hundred ninety-four thousand, six hundred five.
8	A tangerine is split into 8 equal pieces. Someone eats 2 of the slices. Reducing to simplest terms, what fraction of the tangerine is left?
9	Solve for x: x - 78 = 374
10	Arrange these numbers from least to greatest: $\frac{1}{4}$, 5, 2, 0
11	Calculate: $10 – ($3.75 + $0.20)
12	If there are 29 Knuts to a Sickle, and 17 Sickles to a Galleon, how many Knuts are 2 Galleons worth?
13	An average polar bear consumes 4.4 pounds of fat per day. How many pounds of fat will the polar bear consume in a week? Answer as a decimal to the nearest tenth.
14	What is the least common multiple of 14 and 21?
15	What is the sum of all the whole number factors of 17?
16	Biff notices that the weights on a rack weigh a total of 170 pounds. If the rack holds only 5-pound weights, how many weights are on the rack?

17	The polar bear population across the entire world is estimated to be 26,000. If 70% of polar bears are in Canada, how many polar bears are in the rest of the world?
18	Female polar bears usually have 2 cubs at a time. In a group of 12 female polar bears, how many cubs would they have, if one of the females had 3 cubs, and one of the females had 1 cub, and the remainder of the females has 2 cubs?
19	What is the largest prime factor of 2020?
20	Katherine has four green marbles, seven aqua marbles, and eleven golden marbles in her purse. What is the probability that she randomly pulls out a green marble? Express your answer as a reduced common fraction.
21	Calculate: $\mid 5.5 - 17.5 \mid + 6/3 \times (9 - 7)$
22	Find the length of the perimeter of the following shape:
23	The morning temperature was -7°C. By evening, it had risen to 12°C. By how many degrees did the temperature rise?
24	In five days of vacation, the Johnson family drove 375 miles, 423 miles, 314 miles, 406 miles, and 325 miles. How many miles did they drive in all?
25	Wendy can type 25 words every 20 seconds. Denny can type 17 words in 12 seconds. If Wendy and Denny type at their constant rate respectively for 10 minutes, how many more words will Denny have typed?
26	On average, adult male polar bears are 10 feet tall while standing on their hind legs. If there are five polar bears of standing heights 11 feet, 12 feet, 8 feet, 10 feet, and x feet, and this average height fact holds true, what is the value of x?
27	When polar bear cubs are born, they weigh 0.5 kilograms (kg). However, within 8 months, they weigh 45.5 kg. Assuming that the 8 months are all 30 days long, how much weight does a polar bear cub gain per day, as a reduced common fraction in kilograms?
28	Selena wants to cut her circular cake with 3 straight-line vertical cuts. What is the greatest number of pieces she can make?
29	If $2^{15} = 8^x$, what is the value of x?
30	How many ways can Kirb divide 10 identical coins among his 3 friends, making sure that each friend gets at least one coin?

	Challenge Questions: 3 points each
31	If Bernie can paint a wall in 7 minutes, and Sanders can paint a wall in 14 minutes, how many seconds will it take them to paint the wall together?
32	Convert the base-2 number 11110_2 to a base-4 number.
33	If **a@b** = $a^2 - ab$, what is $\|3@(4@2)\|$?
34	Sandra multiplies two cube numbers and divides the product by 8 to get an answer of 729. What is the least possible sum of the two cube numbers?
35	What is the difference of the sum of the numbers 12 through 40 inclusive and the least common multiple of 12 and 40?
36	Chocolate chip cookies cost $8 and macadamia nut cookies cost $13. Minsuh buys 11 cookies, including at least one of each type of cookie. If she had swapped the quantity of each type of cookie she bought around, then Minsuh would have spent $123. How much did Minsuh spend on cookies?
37	How many zeroes are at the end of 20 factorial?
38	According to Goldbach's conjecture, any even number greater than 2 can be expressed as the sum of a pair of 2 prime numbers. The number 68 has two of these pairs. What is the sum of the digits of the numbers in both pairs?
39	How many factors does 5040 have?
40	An analog clock shows the time 7:22 PM. What is the absolute value of the difference between the degree measures of the smaller angle formed by the hands of the clock and the larger angle formed by the hands of the clock now?

"Math Is Cool" Championships – 2019-20

Individual Contest – Answer Key

KEY

	Answer
1	69
2	[$] 9.70
3	6
4	1250
5	21 [vitamins]
6	28.489
7	3,794,605
8	3/4
9	[x =] 452
10	0, $\frac{1}{4}$, 2, 5 (must be in this order)
11	[$] 6.05
12	986 [Knuts]
13	30.8 [pounds]
14	42
15	18

	Answer
16	34 [weights]
17	7,800 [polar bears]
18	24 [cubs]
19	101
20	2/11
21	16
22	40 [units]
23	19 [°C]
24	1,843 [miles]
25	100 [words]
26	9 [feet]
27	3/16 [kg]
28	7 [pieces]
29	5
30	36 [ways]

	Answer
31	280 [seconds]
32	132 [4]
33	15
34	243
35	634
36	[$] 108
37	4 [zeroes]
38	28
39	60 [factors]
40	182 [degrees]

5th Grade

February 28, 2020

"Math Is Cool" Championships – 2019-20

Individual Contest – Score Sheet

Room # _____

SCHOOL NAME _____

STUDENT NAME _____

Team # _____

Total Correct (all columns)

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:			
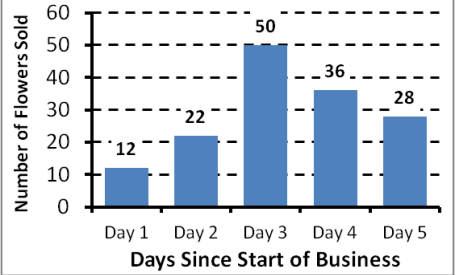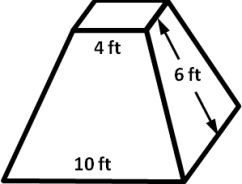
5th Grade

February 28, 2020

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

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Team Multiple Choice Contest

USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #1 THROUGH #3.

Yvonne is starting a business as a florist. Below is a graph depicting the number of flowers sold each day. The x-axis represents days since starting her business. The y-axis represents the number of flowers sold that day.

1 What is the median number of flowers sold in the first five days?

A) 50 　　　　B) 25 　　　　C) 29.6 　　　　D) 28 　　　　E) Answer Not Given

2 From the third to fourth day, by what percentage did flower sales decrease, rounded to the nearest percentage?

A) 128 % 　　B) 39 % 　　C) 28 % 　　D) 22 % 　　E) Answer Not Given

3 Yvonne receives an order for roses to cover all surfaces except the bottom of a parade float piece. The surface to be covered (see figure) is a truncated square pyramid with a 4×4 ft square at the top, a 10×10 ft square base on the bottom, and trapezoidal sides with a slope height of 6 ft. How many square feet will need to be covered by flowers?

A) 184 　　　　B) 284 　　　　C) 42 　　　　D) 168 　　　　E) Answer Not Given

4 Yvonne sells three flowers in multiple colors: roses (red, yellow), tulips (pink, orange, purple), and carnations (white, pink, blue). A customer asks for an arrangement with all three types of flowers, but insists that the three flowers must be a different color. How many possible arrangements could be made?

A) 8 　　　　B) 16 　　　　C) 18 　　　　D) 24 　　　　E) Answer Not Given

Continued on Back Side

	USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #5 THROUGH #10.	

Biff and Eho are going shopping at their local supermarket. The supermarket sells the fruits listed in the table at right.

Item	Price
Banana	$ 3
Starfruit	$ 7
Guava	$ 5
Pineapple	$ 4

5 Biff buys 7 starfruit, 1 pineapple, 3 guava, and 4 bananas to make a Tropical Fruit Salad. How much does he pay for all of that fruit?

A) $49   B) $68   C) $76   D) $84   E) Answer Not Given

6 Having purchased 7 starfruit, 1 pineapple, 3 guava, and 4 bananas, what percent of the total dollars that Biff spent was used for buying the bananas?

A) 18 %   B) 15 %   C) 12 %   D) 4 %   E) Answer Not Given

7 How many distinct ways can you arrange the letters in the word "BANANA"?

A) 360   B) 720   C) 120   D) 60   E) Answer Not Given

8 Eho's Magic Milkshake needs 4 items of any one type of fruit plus 3 items of any other type of fruit. What is the positive difference between the minimum and maximum amount he could spend on fruit to make his Magic Milkshake?

A) $19   B) $24   C) $16   D) $21   E) Answer Not Given

9 Eho's Flavorful Smoothie recipe requires one of each item, plus any 2 other fruits (but not two of the same type). For example, banana, starfruit, pineapple, and guava, plus banana and guava, but not plus guava and guava. What is the average cost of all possible smoothies?

A) $28.50   B) $9.50   C) $38.00   D) $14.25   E) Answer Not Given

10 Biff and Eho want to buy 60 pieces of each fruit for their party. Looking in the boxes, they found that half of the starfruit and 30% of the pineapples were damaged. When they told customer service, a 50% discount was applied to the cost of the damaged fruit. To the nearest ten percent, what percent of the original price did they end up paying for all of the fruit?

A) 80 %   B) 70 %   C) 90 %   D) 60%   E) Answer Not Given

"Math Is Cool" Championships — 2019-20

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Key

Team Multiple Choice Contest – Answer Key

5th 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	C
3	A
4	B
5	E ($80)
6	B
7	D
8	A
9	A
10	C

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Final Score *(out of 20)*

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

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

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, pass out a copy of the test to each team member, 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
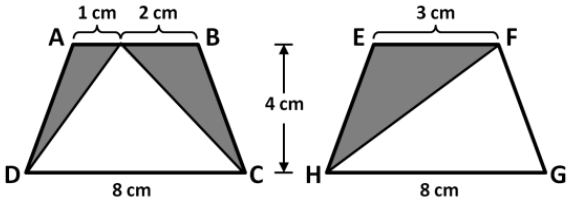worth -1 point, and absence of a response is worth 0 points.

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			
5th Grade	TOTAL:		

Team Contest

1	Angela writes the number "12" nine times in a column, and then adds them all together. JT divides Angela's sum by 3. If JT and Angela both made no mistakes, what was JT's result?
2	Robert was half the age of his sister when she was 4. If Robert's sister is now 20, how old is Robert now?
3	The time 9 hours after 9 AM is also 9 hours before what time?
4	Kyra has a rectangular flower garden with dimensions 4 meters by 7 meters. She wants to surround the garden with a 1-meter wide cobblestone path (see figure at right). What will be the total area of the cobblestone path, in square meters?
5	In the figure at right, the trapezoid ABCD is congruent to the trapezoid EFGH. What is the ratio of the total area of the shaded portion of trapezoid ABCD to the area of the shaded portion of trapezoid EFGH?
6	Three hens can lay 7 eggs in 4 days. How many days will it take for 8 hens to lay 56 eggs?
7	Given the definition that **a @ b** = (a + b) × a². Evaluate: 4@(3@7)
8	Patricia writes the numbers from 85 to 212 inclusive. How many times does she write the digit "1" ?
9	In the multiplication problem shown at right, ABCD and DCBA represent 4-digit numbers, and different letters represent different digits. What 4-digit number does ABCD represent? $\begin{array}{r} A\,B\,C\,D \\ \times\,4 \\ \hline D\,C\,B\,A \end{array}$
10	In tennis, the probability that Zoe wins a point on her first serve is 1/2. If she doesn't win a point on the first serve, she serves again. The probability that she wins a point on her second serve is 5/6. What is the probability that Zoe does not win a point on either her first or second serve?

"Math Is Cool" Championships — 2019-20

5th Grade — February 28, 2020

Key

Team Contest – Answer Key

5th Grade

	Answer
1	36
2	18 [years old]
3	3[:00] AM
4	26 [m²]
5	1 or 1:1 or 1/1
6	12 [days]
7	1504
8	126 [times]
9	2178
10	1/12

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

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			
5th Grade	**TOTAL:**		

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Relay Contest – Questions & Key

RELAYS - 2 relays, 5 minutes per relay, 4 problems per relay, ~15% of team score

There is no talking during this event and you must always be facing forward. The proctor will hand out a strip of paper to each person containing problem(s). These need to remain face down on your desk until it is time for the Relay to start. Once the Relay begins, everyone may turn over their strip of paper and begin working, but first make sure you have the right person number. Person #1 receives a full problem to solve. Questions 2-4 will be missing a number and will show the acronym "TNYWG" (meaning "the number you will get") as a placeholder in the problem statement. The answer for the previous question (i.e., received from the teammate in front of you) should be inserted into the problem statement in place of "TNYWG." Person #1 will have problem #1 on his/her paper. Person #2 will have problems #1 and #2 printed on his/her paper. Person #3 will have problems #2 and #3 on his/her paper and Person #4 will have problems #3 and #4 on his/her paper. You may write on the strip of paper to come up with answers to the problems on your strip of paper. However, when person #1 figures out his/her problem, he/she will record ONLY his/her final answer on the answer sheet and pass only the answer sheet back (without turning around) to the person #2. Person #2 has the option of changing Person #1's answer if he/she wants, by crossing it out and putting a new answer. Once Person #2 records at least an answer for problem #2 on the answer sheet, he/she passes only the answer sheet behind to Person #3. Repeat these steps until person #4 puts an answer on the answer sheet and gives it to the proctor. Teams with only three members can position themselves in positions 2-4 and thus provide answers for all four problems. The raw score will be 1 point for correct answers to problems 1-3 and 2 points for question 4. Any non-answer text (i.e., scratch work or notes) on the answer sheet will result in a score of 0 for the entire Relay.

Relay Practice		Answer
Quest. 1	Caelen has twenty-five dollars to spend at the movie theater. He spends $15 on tickets. How much money, in dollars, will Caelen have left for concessions?	[$] 10[.00]
Quest. 2	What is TNYWG divided by 2?	5
Quest. 3	What is TNYWG squared?	25
Quest. 4	Reduce the fraction 5/TNYWG to simplest terms.	1/5
Relay #1		**Answer**
Quest. 1	Samuel is counting aloud upwards by nines. He starts at 63. What is the third odd number that he will say?	99
Quest. 2	What is the sum of the digits in TNYWG multiplied by the quotient of 36 and 12?	54
Quest. 3	Shael has TNYWG guitar picks. He loses 2 guitar picks every day and buys 2 new picks at the end of each week. After how many weeks will Shael first run out of guitar picks?	5 [weeks]
Quest. 4	The smaller side length of a rectangle is (TNYWG + 4) units long. The larger side of the rectangle is double the smaller side length. What is the area of this rectangle?	162 [units²]
Relay #2		**Answer**
Quest. 1	What is the positive difference between the product of 6 and 7 and the sum of 12 and 23?	7
Quest. 2	Allison goes to the coffee stand TNYWG times a week. She spends 3 dollars each visit. How many dollars will she spend at the coffee stand in four weeks?	[$] 84[.00]
Quest. 3	Kayden has TNYWG dollars to spend on a pair of rainbow tie-dye sneakers. When she reaches the store, she finds that sneakers cost TNYWG dollars, but are on sale at 25% off. How many much money, in dollars, will Kayden end up with after her purchase?	[$] 21[.00]
Quest. 4	The complementary angle for a TNYWG-degree angle has a supplementary angle of how many degrees?	111 [degrees]

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Final Score *(out of 5)*

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

RELAY — PRACTICE ROUND

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
0 or 1	0 or 1	0 or 1	0 or 2
Proctor — (circle value)	Proctor — (circle value)	Proctor — (circle value)	Proctor — (circle value)

Fill in your answer and pass this sheet back to the next person without turning around.
No scratch work is allowed on this answer sheet.

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Final Score *(out of 5)*

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

RELAY — PRACTICE ROUND

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
0 or 1	0 or 1	0 or 1	0 or 2
Proctor — (circle value)	Proctor — (circle value)	Proctor — (circle value)	Proctor — (circle value)

Fill in your answer and pass this sheet back to the next person without turning around.
No scratch work is allowed on this answer sheet.

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Final Score *(out of 5)*

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

RELAY #1

Answer for question # 1		Answer for question # 2		Answer for question # 3		Answer for question # 4	
0 or 1		0 or 1		0 or 1		0 or 2	
Scorer 1 (circle value)	Scorer 2 (checkmark)	Scorer 1 (circle value)	Scorer 2 (checkmark)	Scorer 1 (circle value)	Scorer 2 (checkmark)	Scorer 1 (circle value)	Scorer 2 (checkmark)

Fill in your answer and pass this sheet back to the next person without turning around.
No scratch work is allowed on this answer sheet.

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

Final Score *(out of 5)*

| Room # | School Name | Team # |

RELAY #2

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
0 or 1	0 or 1	0 or 1	0 or 2
Scorer 1 (circle value) — Scorer 2 (checkmark)	Scorer 1 (circle value) — Scorer 2 (checkmark)	Scorer 1 (circle value) — Scorer 2 (checkmark)	Scorer 1 (circle value) — Scorer 2 (checkmark)

Fill in your answer and pass this sheet back to the next person without turning around.
No scratch work is allowed on this answer sheet.

Relay Practice – Person 1	
Question 1	Caelen has twenty-five dollars to spend at the movie theater. He spends $15 on tickets. How much money, in dollars, will Caelen have left for concessions?

Relay Practice – Person 2

Question 1	Caelen has twenty-five dollars to spend at the movie theater. He spends $15 on tickets. How much money, in dollars, will Caelen have left for concessions?
Question 2	What is TNYWG divided by 2?

Relay Practice – Person 3

Question 2	What is TNYWG divided by 2?
Question 3	What is TNYWG squared?

	Relay Practice – Person 4
Question 3	What is TNYWG squared?
Question 4	Reduce the fraction 5/TNYWG to simplest terms.

Relay #1 – Person 1

Question 1	Samuel is counting aloud upwards by nines. He starts at 63. What is the third odd number that he will say?

Relay #1 – Person 2

Question 1	Samuel is counting aloud upwards by nines. He starts at 63. What is the third odd number that he will say?
Question 2	What is the sum of the digits in TNYWG multiplied by the quotient of 36 and 12?

Relay #1 – Person 3

Question 2	What is the sum of the digits in TNYWG multiplied by the quotient of 36 and 12?
Question 3	Shael has TNYWG guitar picks. He loses 2 guitar picks every day and buys 2 new picks at the end of each week. After how many weeks will Shael first run out of guitar picks?

Relay #1 – Person 4

Question 3	Shael has TNYWG guitar picks. He loses 2 guitar picks every day and buys 2 new picks at the end of each week. After how many weeks will Shael first run out of guitar picks?
Question 4	The smaller side length of a rectangle is (TNYWG + 4) units long. The larger side of the rectangle is double the smaller side length. What is the area of this rectangle?

Relay #2 – Person 1

Question 1	What is the positive difference between the product of 6 and 7 and the sum of 12 and 23?

Relay #2 – Person 2

Question 1	What is the positive difference between the product of 6 and 7 and the sum of 12 and 23?
Question 2	Allison goes to the coffee stand TNYWG times a week. She spends 3 dollars each visit. How many dollars will she spend at the coffee stand in four weeks?

Relay #2 – Person 3

Question 2	Allison goes to the coffee stand TNYWG times a week. She spends 3 dollars each visit. How many dollars will she spend at the coffee stand in four weeks?
Question 3	Kayden has TNYWG dollars to spend on a pair of rainbow tie-dye sneakers. When she reaches the store, she finds that sneakers cost TNYWG dollars, but are on sale at 25% off. How many much money, in dollars, will Kayden end up with after her purchase?

Relay #2 – Person 4

Question 3	Kayden has TNYWG dollars to spend on a pair of rainbow tie-dye sneakers. When she reaches the store, she finds that sneakers cost TNYWG dollars, but are on sale at 25% off. How many much money, in dollars, will Kayden end up with after her purchase?
Question 4	The complementary angle for a TNYWG-degree angle has a supplementary angle of how many degrees?

"Math Is Cool" Championships — 2019-20
5th Grade — February 28, 2020

_____   _____   _____
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 — 2019-20
5th Grade — February 28, 2020

_____   _____   _____
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 — 2019-20

5th Grade — February 28, 2020

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 the product of nine and six?	
2	What is the perimeter of a square with side length five?	
3	What is the next number in the arithmetic sequence that begins: two, six, ten, and fourteen?	
4	If it takes eight cowboys to lasso three bulls, how many cowboys does it take to lasso twelve bulls?	
5	How many MINUTES will it take me to bike five miles if I am biking at a speed of fifteen miles per hour?	
6	Kirby spent three times as much on a hamburger than his soda. If Kirby spent twelve dollars in all, how much did Kirby's soda cost, in dollars?	
7	If today is Friday, then what day will it be one hundred fifty-seven days from now?	
8	What is the smallest positive whole number by which the number twenty can be multiplied to obtain a perfect square number?	

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5th Grade — February 28, 2020

Key

Relay Contest – Answer Key

(Proctor — Hide this Key from View of Competitors. Items in brackets [·] are optional.)

RELAY — PRACTICE ROUND

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
[$] 10[.00]	5	25	1/5

RELAY #1

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
99	54	5 [weeks]	162 [units^2]

RELAY #2

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
7	[$] 84[.00]	[$] 21[.00]	111 [degrees]

COLLEGE BOWL ROUND #1

#	Problem	Answer
1	Altogether, how many sides do three nonagons have?	27
2	What is the next term in the sequence: five, twenty-five, one hundred twenty five, and so on?	625
3	As a reduced common fraction, what is the probability of rolling a number greater than two on a standard six-sided die?	"two-thirds" or "two over three"
4	In a class of twenty-five students, sixteen are boys. What percent of the class consists of boys?	64 [percent]
5	Peter arrived in Germany on the morning of July 6th 2018 and left Germany after dark on the 6th of January 2019. How many days was Peter in Germany?	185 [days]
6	A 1986 Yugo car is offered for sale at eight-hundred dollars. What is the sale price in dollars if a thirty percent discount is applied?	560 [dollars]
7	If Katherine randomly chooses a pencil from a box of thirteen Ticonderoga, two Palomino, and three Statler brand pencils, what is the probability that she chooses a Statler pencil?	"one-sixth" or "one over six"
8	How many different ways can you arrange the letters in the word ROSS, spelled R-O-S-S?	12 [ways]
9	What is the tens digit in the product of seventeen and twenty-five?	2
10	What is one-half of three-fourths?	"three-eighths" or "three over eight"

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COLLEGE BOWL ROUND #2

#	Problem	Answer
1	What is the product of fourteen and nine?	126
2	Stanley reads for an hour every day of the week. In one week, how many minutes does he read?	420 [minutes]
3	How many legs do twelve cows have?	48 [legs]
4	Sam and Ted can inflate three balloons in seven minutes. How many balloons can they inflate in five hundred sixty seconds?	4 [balloons]
5	A man is playing fetch with a dog. He always throws the ball exactly 12 feet away. How many feet has the dog run after it finishes returning the ball for the seventeenth time?	408 [feet]
6	Biff has four boxes and some rocks. Biff notices that no matter how many boxes he picks, he can always split his rocks evenly between the boxes with no leftovers. What is the smallest number of rocks that Biff can have?	12 [rocks]
7	Ellen has a bag with six green marbles, seven turquoise marbles, and two clear marbles. If she randomly chooses a marble, what is the probability that Ellen chooses a green marble?	"two-fifths" or "two over five"
8	What is the least common multiple of 12 and 8?	24
9	How many pints are in four gallons and three quarts?	38 [pints]
10	Tara eats three scones for every cup of tea that she drinks. If she drinks five cups of tea, how many scones has she eaten?	15

COLLEGE BOWL ROUND #3

#	Problem	Answer
1	Craig can type sixty-four words per minute. How many minutes would it take for him to type a three hundred twenty word essay?	5 [minutes]
2	What is the difference of five hundred seventy-three and three hundred sixty-seven?	206
3	What is the volume of a cube with side length eight?	512 [cu. units]
4	How many prime numbers are there between 20 and 50?	7 [prime numbers]
5	Eho is in the business of selling compressed air. If one cubic foot of air costs twenty-seven cents, how many CENTS does one cubic yard of compressed air cost?	729 [cents]
6	Matilda has 18 pets, some cats and some chickens, but there are only 64 legs. How many cats does she have?	14 [cats]
7	What is one hundred eleven times one hundred eleven?	12,321 or "twelve thousand three-hundred twenty-one"
8	What is the area of a circle with radius six?	36 pi [sq. units]
9	Phillip eats three meals every day. How many meals does he eat in the month of December?	93 [meals]
10	What is three hundred twenty-one divided by three?	107

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COLLEGE BOWL ROUND #4

#	Problem	Answer
1	How many minutes are in two days?	2880 [minutes]
2	Anna can eat a mandarin orange in three minutes. How many full mandarin oranges can she eat in twenty-eight minutes?	9 [mandarin oranges]
3	A type of spotted mushroom gains four spots every night. If the mushroom started with eight spots, how many nights will it take until it has thirty-two spots?	6 [nights]
4	Find the next number in the sequence that begins four, five, seven, ten, fourteen, and so on.	19
5	What is the sum of the first eleven odd whole numbers?	121
6	Yohan rents cars that can each hold seven Mathletes. What is the least number of rental cars that the Math Team needs to rent for their 38 members to all go to the math contest?	6 [cars]
7	Vladimir the hamster lives in a cage that is twenty centimeters by twenty centimeters by ten centimeters. What is the volume of the cage in cubic centimeters?	4,000 [cu. cm]
8	If Bob Ross paints four paintings in two hours, what is the average number of minutes that Bob spends painting one painting?	30 [minutes]
9	What is the remainder when six hundred eighty-nine is divided by seven?	3
10	Sally is twelve years old and her sister is four years old. In thirty-two years, what will the difference in their ages be?	8 [years]

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COLLEGE BOWL ROUND #5

#	Problem	Answer
1	How many weeks are in ninety-one days?	13 [weeks]
2	Jacob has three soccer practices every week, each being one hour long. How many hours of soccer did he play in seven weeks?	21 [hours]
3	Sarah pays for a tie-dye shirt that costs two dollars and thirty-nine cents with a five dollar bill. What is her change in dollars and cents?	"two dollars and sixty-one cents" or "two point six one"
4	Two sides of an isosceles right triangle are each measured to be the square root of 8 in length. What is the length of the third side?	4 [units]
5	Four consecutive odd numbers have a sum of forty-eight. What is the smallest of these four numbers?	9
6	What is the sum of greatest common factor and least common multiple of the numbers 12 and 16?	52
7	On Tuesday, the chance of rain is twenty percent. On Wednesday, the chance of rain is fifty percent. What is the probability that it does NOT rain both days?	"two-fifths" or "two over five" or 40%
8	Biff can eat one hamburger in one hundred eighteen seconds. If Eho eats hamburgers twice as fast as Biff, how many seconds does it take Eho to eat one hamburger?	59 [seconds]
9	Josie runs three miles every day throughout the month of June. How many miles did she run in June?	90 [miles]
10	What is the mean of eight, twenty-one, and thirteen?	14

Key

COLLEGE BOWL ROUND #6

#	Problem	Answer
1	Emma has a spinner that is equally split between the colors red, orange, yellow, green, and blue. What is the probability that the spinner lands on red or orange?	"two fifths" or "two over five"
2	What is the absolute difference of negative five and twelve?	17
3	There are fifteen apples and five oranges in a crate. What is the percentage of oranges in the crate?	25 [percent]
4	How many diagonals can be drawn in a regular pentagon?	5 [diagonals]
5	Ben has fifty cents. What is the least number of coins he could have, if he does not have any quarters and he has more than one type of coin?	6 [coins]
6	What is the remainder when 36482 is divided by 9?	5
7	Convert the fraction seventy-two over four hundred eighty to a percentage.	15 [percent]
8	There are five petals on each forget-me-not flower. Allie has a bouquet of ten forget-me-nots. However, one of the flowers has lost three petals. How many forget-me-not petals are in the bouquet in all?	47 [petals]
9	What is thirty percent of half of sixty?	9
10	Kimberly has a rectangular garden that is six feet long and four feet wide. How many feet long is the perimeter of the garden?	20 [feet]

Key

COLLEGE BOWL — EXTRA Qs

#	Problem	Answer
1	If Mr. Ken has twelve desks, but needs seven more to seat all of his students. How many students does he have in his class?	19
2	At Robin Baskin's, there are fourteen ice cream flavors, five different cones, and three different spoons. If an order consists of an ice cream flavor, a cone, and a spoon. How many distinct orders are possible?	210 [orders]
3	What is three point nine times thirty?	117
4	If Jonas is driving at twenty miles per hour, how far will he drive in fifteen minutes, in miles?	5 [miles]
5	Andy randomly chooses marbles from a bag that has three green, four yellow, and eight red marbles. What is the probability that he chooses a green marble?	"one fifth" or "one over five" or "20 percent"
6	It takes fourteen minutes to fill a bathtub with water using one faucet. How many minutes will it take to fill the bathtub, if another faucet of the same flow rate is also used?	7 [minutes]