"Math is Cool" Championships -- 2022-23

4th Grade

Mental Math Solutions

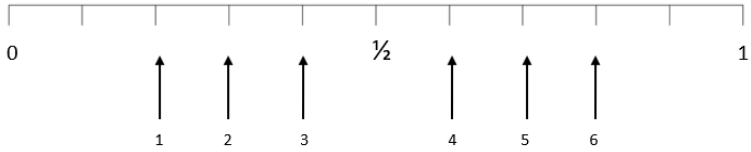
	Answer	Solution
1	7	What is the quotient of 56 and 8? 56/8 = 7
2	18 [units]	What is the perimeter in units of a regular hexagon with a side length of 3 units? 6*3 = 18
3	50 [minutes]	How many minutes are between 10:15 AM and 11:05 AM? 45+5 = 50
4	250 [cm]	How many centimeters are in 2.5 meters? 2.5 meters * 100cm/m = 250
5	29	What term comes next in the arithmetic sequence that begins with 11, 17, 23, and so on? Common difference of +6 23+6 = 29
6	9 [girls]	In a class, two-fifths of the children are boys and the rest are girls. If there are fifteen students, how many are girls? 3/5 are girls. 3/5 * 15 = 9
7	784 [cents]	If one candy bar costs $1.96, how many CENTS do 4 candy bars cost? 196*4
8	24	What is the sum of all of the factors of 15? 1+3+5+15 = 24

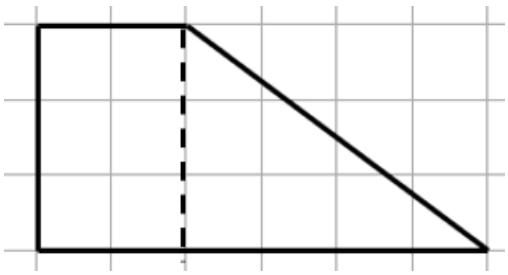
"Math is Cool" Championships -- 2022-23

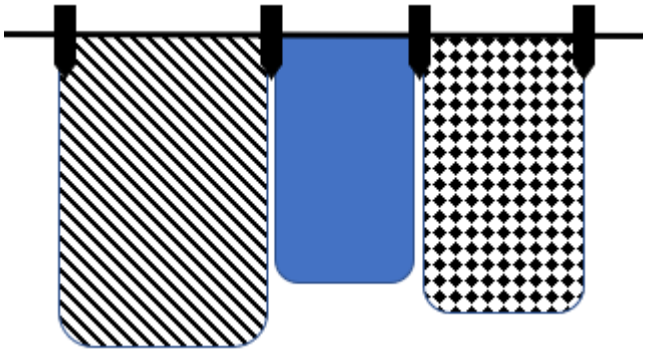
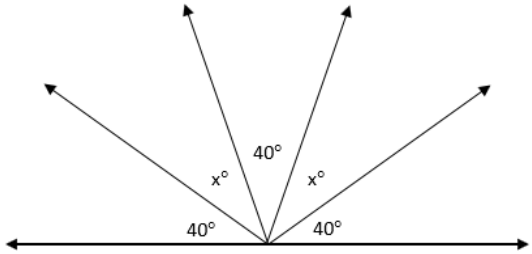
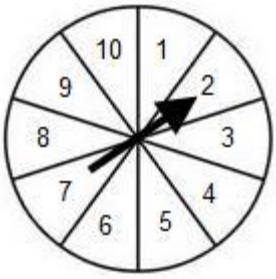
4th Grade

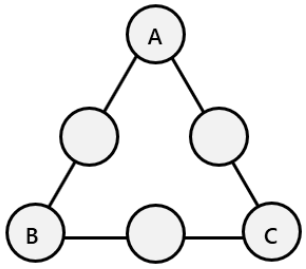
Individual Test Solutions

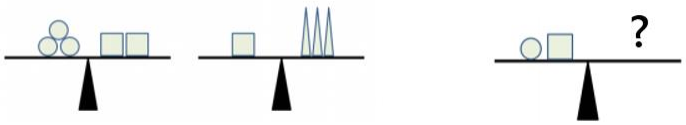
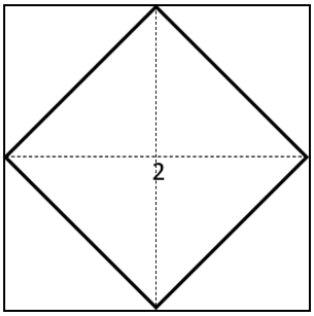
	Answer	Solution
1	25 [gumballs]	Biff had 10 gumballs but then got 15 more from Eho. How many gumballs does Biff have now? 10 + 15 = 25
2	120 [minutes]	How many minutes are in two hours? 2*60 = 120
3	26	What is the next number in the following arithmetic sequence? 10, 14, 18, 22, …, Pattern is +4
4	5 [bars]	Children between the ages of 9 and 13 need approximately 30 grams of protein each day. A certain snack bar contains 6 grams of protein. How many of these snack bars would a 10-year old child need to eat in one day to fulfill their protein needs? 6 g x 5 bars = 30 gram
5	9	What is the median of the following numbers? 2, 19, 5, 10, 9 Put in order: 2, 5, 9, 10, 19
6	2	Evaluate: $10 \div (2 + 3)$ $10/5 = 2$
7	4 [sides]	How many sides does a parallelogram have? Parallelograms have 4 sides.
8	13	What is the largest prime number that is less than 15? 14 is composite, 13 is prime.
9	30 [%]	A bag of jelly beans has 3 green jelly beans, 4 yellow jelly beans and 3 red jelly beans. If one jelly bean is randomly selected, what is the probability in percent that it is red? 3/10 = 30%
10	6	What number is 1/3 of 18? 18x(1/3) = 6
11	63 [square meters]	What is the area in square meters of a rectangle with sides measuring 9 meters and 7 meters? 9x7 = 63

<table>
<tr><td>12</td><td>1250</td><td>What number is halfway between 1200 and 1300?
They are 100 apart, so halfway will be 1200 + 50</td></tr>
<tr><td>13</td><td>3</td><td>In how many different ways can two identical nickels and one penny be arranged in a line?
NNP
NPN
PNN</td></tr>
<tr><td>14</td><td>110</td><td>What is 50% of 220?
50% is half. 220/2 = 110</td></tr>
<tr><td>15</td><td>55 [minutes]</td><td>Maria put a coffeecake in the oven at 12:05 pm. She took the coffeecake out of the oven at 1:00 pm the same day. How many minutes was the coffeecake in the oven?
It is 5 minutes less than an hour, and 60 – 5 = 55.</td></tr>
<tr><td>16</td><td>105</td><td>What is the smallest three-digit positive multiple of 15?
15*7 = 105</td></tr>
<tr><td>17</td><td>16 [students]</td><td>The following table shows the number of students in various elective classes at their school. What is the mean number of students taking an elective class?
(14+17+14+19)/4 = 16
<table><tr><th>Elective Class</th><th>Number of Students</th></tr><tr><td>Painting</td><td>14</td></tr><tr><td>Debate</td><td>17</td></tr><tr><td>Photography</td><td>14</td></tr><tr><td>Journalism</td><td>19</td></tr></table></td></tr>
<tr><td>18</td><td>3</td><td>On the
 
following number line, which numbered arrow indicates the position of the fraction 2/5 ? Enter an integer from 1 through 6 as your answer.
The number line is split into tenths. 2/5 = 4/10, which is indicated by arrow #3.</td></tr>
<tr><td>19</td><td>4 [ounces]</td><td>Water is added to frozen lemon concentrate to make lemonade. The final lemonade mixture consists of 7/9 water. In an 18 ounce serving of lemonade, how many ounces of frozen lemon concentrate are there?
7/9 = 14/18
14 oz is water, 4 oz is lemon concentrate</td></tr>
</table>

20	4	How many of the following statements are true? $8 \div 2 < 5$ $10 = 2 \times 5$ $1 + 2 + 10 > 12$ $10 \times 4 = 2 \times (10 \times 2)$ They are all true: $4 < 5$ $10 = 10$ $13 > 12$ $40 = 40$
21	36	The numbers x and y are the next two numbers in the following sequence. What is y? 1, 4, 9, 16, x, y, … The squares of the natural numbers.
22	1 [friend]	Three friends are playing a game. They have four hats in a box, two blue hats and two red hats. Each friend closes their eyes and randomly chooses a hat and puts it on. The leftover hat remains in the box. After opening their eyes, they can see their friend's hats but not their own. Rohan sees that Shryta is wearing a red hat and Alex is wearing a blue hat. Out of the three friends, how many of them know the color of their own hat? Two friends must be wearing the same color hat. Therefore, the third friend who can see them both knows the color of their own hat.
23	23	Add, and express your answer as a whole number: $6\frac{1}{3} + 11\frac{2}{3} + 5$ 6+11+5 = 22 1/3 + 2/3 = 1 22+1 = 23
24	12 [square units]	Find the area of the trapezoid in square units. Each square on the grid is 1 unit by 1 unit. The area of the rectangle to the left of the dashed line is 6 units^2. The area of the remaining triangle is (3)(4)/2 = 6 units^2. Total area = 12 units^2. 

25	10 [clothespins]	Chris hangs the kitchen towels on a clothesline. They want to use as few clothespins as possible. For example, 4 clothespins are needed to hang 3 towels, as shown. What is the minimum number of clothespins needed to hang 9 towels?  8 "inside" pins plus one at each end equals 10 pins total.
26	16	If x = 3 and y = 4, what does 4x + y equal? 4(3) + 4 = 16
27	18	How many 2-digit positive integers are multiples of 5? 5*2 = 10 through 5*19 = 95, therefore 18.
28	30 [°]	In the figure shown here, the five angles (40°, x°, 40°, x°, 40°) form a straight line when placed together. What is the measure of one angle 'x', in degrees?  The entire line is 180°. Subtract off 40x3 = 120: 180 – 120 = 60°. 60/2 = 30°.
29	40 [%]	The spinner is split into equally sized segments. When the arrow is spun, it is equally likely to land on any of the segments. On a single spin, what is the probability in percent that it lands on a prime number?  Primes: 2, 3, 5, 7 4/10 = 40%
30	22499	A whole number rounded to the nearest thousand is 22,000. What is the largest possible value for the number? 22499 rounds to 22000 to the nearest thousand, but 22500 rounds to 23000.

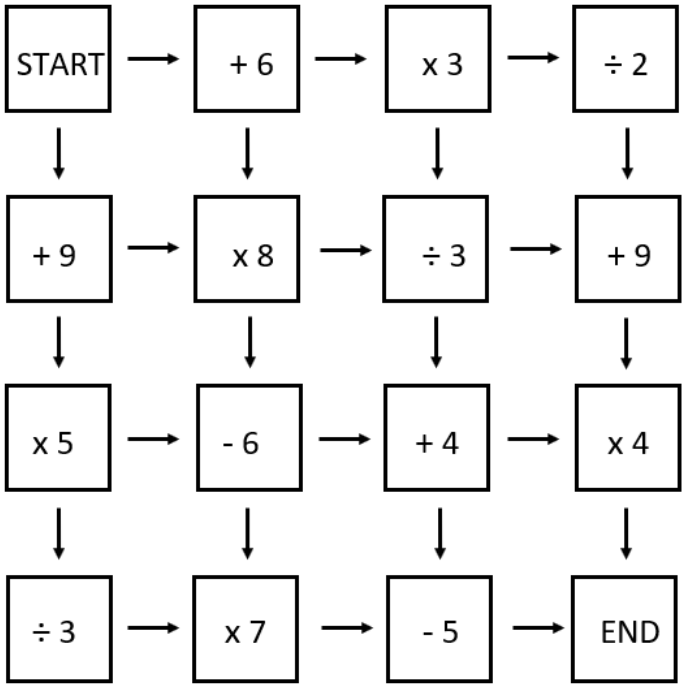
31	14	If a◆b = 2a + 3b, find the value of 4◆2. 2(4) + 3(2) = 14
32	42	Chloe writes a list of 10 consecutive integers. The sum of the least and greatest numbers on her list is 93. What is the smallest number in her list? Can use some trial and error to discover that the 10 integers are: 42, 43, …, 51
33	44 [students]	All students in 8th grade at a middle school are learning either Spanish or French, but not both. If 55% of the students are learning Spanish and 36 students are learning French, how many students are learning Spanish? X = total 0.45x = 36 X = 80 80 – 36 = 44
34	6	Place the numbers 1 through 6 in the circles, using each number exactly once, so that the total you get by adding the numbers along each side is always 9. What is the value of A + B + C? The numbers 1, 2 and 3 have to go in the vertices. 
35	150000	The number 2,528 has only one odd digit, and the value of this odd digit is 500, because the 5 is in the hundreds place. What is the product of the values of all the odd digits in 65,213? 5000*10*3
36	2 [orders]	Five friends, Aditya, Brendan, Cam, Deepti and Elle run a race against each other. The following information is known about the results (there were no ties): • Aditya finishes either second or fourth. • Brendan finishes either first or fifth. • Cam finishes either third or fourth. • Deepti finishes either first or second. • Elle finishes either third or fifth. In how many different orders could the friends have placed 1st through 5th in the race? The only possible orders are: BDCAE DAECB

37	5 [triangles]	The first two scales shown are evenly balanced. In the third scale, how many triangles will it take to balance one circle and one square?  3 triangles to balance the one square. 6 triangles to balance 3 circles on first scale, therefore 2 triangles to balance 1 circles. 3+2=5
38	-1011	Evaluate: 1 – 2 + 3 – 4 + 5 – 6 + … + 2021 – 2022 Each "pair", such as 1 – 2, or 3 – 4, etc., = -1. There are 2022/2 = 1011 pairs.
39	2 [square units]	The square shown here has a diagonal length of 2 units. What is the area of the square, in units squared? Draw a new square around the original square. This square has side length = 2, and area = 4 units^2. The original square occupies half the space, so the area is 4/2 = 2 units^2. 
40	12	In the following figure, composed of three unit squares, each square can be colored either black, orange or purple. A color can be used in more than one square. How many different ways are there to color the squares so that any two adjacent squares (next to each other) are not the same color?  Colors are B,O,P Case 1: B in first square BOP BOB BPO BPB The same will be true for O and P in the first square, so a total of 4x3 = 12 ways.

"Math is Cool" Championships -- 2022-23

4th Grade

Multiple Choice Solutions

	Answer	Solution
USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #1 THROUGH #3. To complete the maze, you will begin at the upper-left corner in the 'START' box, with a starting score of 0. You will make one move at a time, by following the arrows either to the right or down. You may only move to a neighboring box, no skipping is allowed. Each time you move, you will take your current score and perform the indicated operation, either addition, subtraction, multiplication, or division, which will then give you a new score. The maze is over when you reach the 'END' box.		
1	B	From the START box, if you move to the right 3 steps, followed by 3 steps down, what will your score be when you reach the END? A) 56 B) 72 C) 100 D) 354 E) Answer not given. 0 + 6 = 6 6 x 3 = 18 18/2 = 9 9 + 9 = 18 18 x 4 = 72

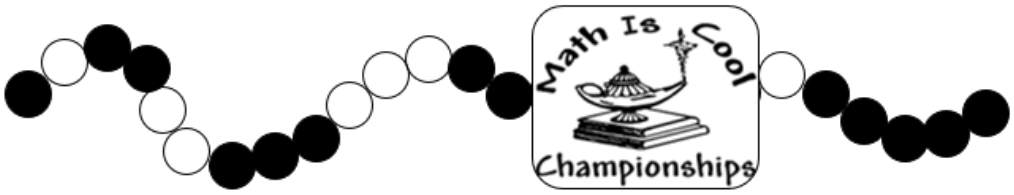
2	*C*	By choosing any allowable route, what is the highest score that can be achieved when you reach the END? A) 126 B) 354 C) 457 D) 502 E) Answer not given. 0 + 9 = 9 9 x 8 = 72 72 – 6 = 66 66 x 7 = 462 462 – 5 = 457
3	*A*	How many different routes will give you an ending score of exactly 100? A) 2 B) 3 C) 4 D) 5 E) Answer not given. First one is: DDDRRR Second one is: RDRRDD

USE THE FOLLOWING INFORMATION TO SOLVE PROBLEMS #4 THROUGH #7.

Mr. Mabry won a contest by correctly guessing how many sugar cubes were contained in a jar. As his prize, the sugar company sent him one million sugar cubes. The one million sugar cubes were stacked so that they formed one perfect cube and were wrapped in plastic for shipment in a box sized perfectly to contain the cube.

Each individual sugar cube measures 1 cm by 1 cm by 1 cm.

4	*C*	What is the surface area of a single sugar cube? A) 1 cm^2 B) 4 cm^2 C) 6 cm^2 D) 10 cm^2 E) Answer not given. Each face of the cube = 1x1 = 1 cm^2 x 6 faces = 6 cm^2.
5	*A*	A single sugar cube weighs 1.6 grams. How much do one thousand of the sugar cubes weigh, in kilograms? A) 1.6 kg B) 100 kg C) 160 kg D) 1600 kg E) Answer not given. 1.6 x 1000 = 1,600 g. Divide by 1000 to get 1.6 kg.

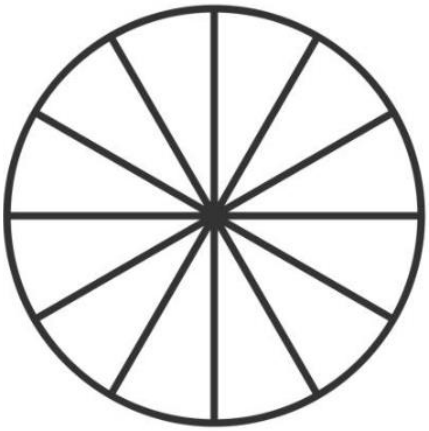
6	*C*	With the cubes still in their original packaging as described above, approximately what size of a storage area will Mr. Mabry need to store his cube of sugar cubes? A) Inside a small backpack. B) Under a low (1-foot tall) coffee table in the living room. C) Inside a large, deep storage closet. D) It will fill his 2-car garage. E) Mr. Mabry will need to rent a large warehouse. The cubes are in a 100x100x100 array. Therefore, each dimension is 100 cm long, which is 1 meter, which is roughly a yard. Visualizing a box of this size, it will definitely not fit in a backpack or under a low coffee table, and it will definitely not fill a 2-car garage. The most appropriate choice is the closet.
7	*A*	Mr. Mabry unwraps his cubes and removes one full layer of cubes from the top of the cube structure. Then he removes one full layer of cubes from the front of the cube structure. How many individual cubes remain in the original structure? A) 980,100 B) 989,100 C) 990,100 D) 990,900 E) Answer not given. Removing the top layer removes 100x100 = 10,000 cubes. Then removing the front layer removes an additional 100x99 = 9900 cubes. 1000000 – 10000 – 9900 = 980,100
8	*E*	In the following string of beads, which ones are covered by the Math Is Cool banner?  A)  B)  C)  D)  E)  The pattern is: B, W, BB, WW, BBB, WWW, BBBB, WWWW, etc. Therefore, what is hidden is BBWWW

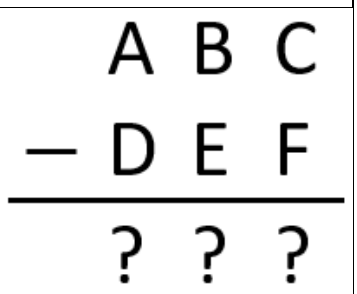
9	E	Lilac bushes are planted in a straight line along both sides of a driveway. The distance between the lilac bushes on each side of the driveway is 2 meters. What is the maximum number of bushes that can be planted if the driveway is 20 meters long? A) 10 B) 11 C) 12 D) 20 E) 22 Eleven can be planted on each side, for a total of 22.
10	D	A math team started out with 10 boys and 15 girls. However, every week 3 more boys joined and 2 more girls joined the team. After a few weeks, there was an equal number of boys and girls on the team. How many total students were on the math team at that point? A) 25 B) 35 C) 45 D) 50 E) 60 After 5 weeks, the boys have gained 5*3 = 15, for a total of 25 boys. The girls have gained 5*2 = 10, for a total of 25 girls.

"Math is Cool" Championships -- 2022-23

4th Grade

Team Test Solutions

	Answer	Solution
1	450 [minutes]	If Merlin takes 45 minutes to brew one potion, how long in minutes does it take for him to brew 10 potions? 45*10 = 450
2	9 [segments]	The following circle is split into equal-sized segments. How many of the segments need to be colored in, in order to have 75% of the circle colored?  There are 12 segments. 75% or $\frac{3}{4}$ of 12 is 9.
3	64 [cents]	Hunter found one quarter on Monday, two dimes on Tuesday, three nickels on Wednesday, and four pennies on Thursday. How many cents did he find over those four days? 25+20+15+4 = 64
4	36 [candies]	Luis decides to share a package of candies with his siblings. He first gives a quarter of the candies to his older brother Manuel. After that he splits the remaining candies evenly between himself and his two younger sisters. If each of his sisters received 9 candies and there were none left over, how many candies did the package start with? Each sibling received a quarter of the package. 9*4 = 36

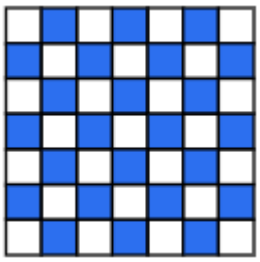
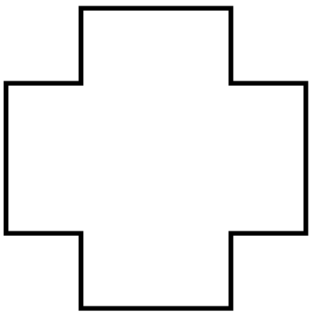
5	18 [units]	A triangle has two sides of lengths 7 units and 12 units. What is the longest possible length of the third side, in units, if it must also be an integer. 19 units long would no longer form a polygon so 18 is the largest value.
6	2	What is the positive difference between the mean and the median of the following data set? {3, 4, 6, 14, 2, 13} Sort: {2, 3, 4, 6, 13, 14} Sum = 42 Mean = 42/6 = 7 Median = (4 + 6)/2 = 5 Mean – Median = 7 – 5 = 2
7	576 [square yards]	Veena is surrounding a rectangular garden with 96 yards of fencing, where all side lengths will be whole numbers. What is the largest area, in square yards, that the garden can be? The garden must be a square with a side length of 24 yards. 24*24 = 576
8	531	The digits 1 through 6 are each used exactly once to create two 3-digit numbers, ABC and DEF. What is the largest possible result for the difference of the two numbers when DEF is subtracted from ABC? 654 - 123 = 531 
9	9 [schools]	Several schools competed in a cross-country meet. Each team sent three participants. Mary, Matt, and Medha were the three representatives for Handley Middle School. Mary finished the race in exactly the middle position of all the competitors. Matt finished after Mary in the 16th position, and Medha finished 23rd. How many schools took part in the race? There must be an odd number of runners to have a middle position and at least 23 runners because of where Medha placed. The number of runners must be a factor of 3. 27 runners would have a middle of 14th. 33 runners would have a middle of 17th. But Matt finished in 16th, after Mary. The only remaining middle position would be for 27 runners, or 9 schools.

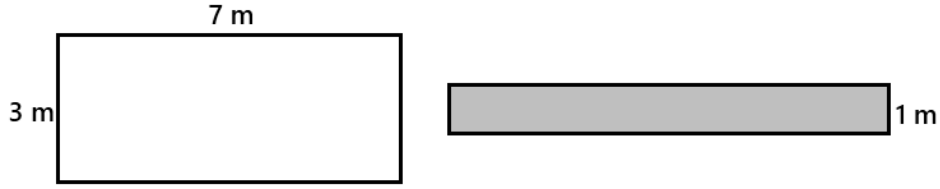
10	8 [miles per hour]	Catalina lives at the bottom of a very tall hill. One day she begins biking up the hill at a constant speed of 6 miles per hour. At the top, she immediately turns around and coasts back to her house at a constant 12 miles per hour. What was Catalina's average speed during the bike ride, in miles per hour? The rate is independent of distance travelled. Assume 24 miles total, 12 miles up and 12 miles down. Therefore, 2 hours up the hill, 1 hour riding down. 24 miles / 3 hours = 8 miles per hour.

"Math is Cool" Championships -- 2022-23

4th Grade

Linda Moore Triple Jump Solutions

	Answer	Solution
1	25 [cm^2]	The following checkerboard is made up of unit squares. The total area of the checkerboard is 49 cm^2. What is the combined area of the white squares, in cm^2? There are 49 total squares, each with an area of 1 cm^2. There are 25 white squares. 
2	23 [cards]	While organizing her Pokémon cards, Olivia put 3 cards in the first pile, 5 cards in the second pile, 9 cards in the third pile, and 15 cards in the fourth pile. If this pattern continues, how many cards will Olivia put in the fifth pile? Pattern is: +2, +4, +6, … 15+8 = 23
3	4 [lines]	How many lines of symmetry does the following shape have? Horizontally, vertically, and each diagonal through the center. 
4	9	Choose two numbers from the box to complete the number sentence below, by putting one number in each box. What is the larger of the two numbers? 2 3 4 5 6 7 8 9 10 11 ☐ and ☐ have a product of 54. 9x6 = 54

5	9 [square meters]	The rectangles shown here have the same perimeter, in meters. What is the area, in square meters, of the shaded rectangle?  The perimeter of the first rectangle = 3+7+3+7 = 20. Therefore, the other side length of the shaded rectangle is 9 m. Area = 9x1 = 9.
6	91	What is the sum of the distinct positive factors of 36? 1+2+3+4+6+9+12+18+36 = 91
7	22 [times]	At midnight, the hour and minute hand of an analog clock completely overlap. How many times do the hour and minute hands completely overlap over a 24-hour period that starts at 6:00 AM? 6:33am, 7:38am, 8:44am, 9:49am, 10:55am, 12:00pm, 1:05pm, 2:11pm, 3:16pm, 4:22pm, 5:27pm, 6:33pm, 7:38pm, 8:44pm, 9:49pm, 10:55pm, 12:00am, 1:05am, 2:11am, 3:16am, 4:22am, 5:27am
8	9 [integers]	For how many two-digit integers does the sum of the integer's digits equal 9? For example, the number 15 has a sum of 1 + 5 = 6. Cases: 18, 27, 36, 45, 54, 63, 72, 81, 90
9	5 [hours]	It takes 15 lumberjacks 6 hours to chop down 81 trees. Working at the same rate, how many hours would it take 26 lumberjacks to chop down 117 trees? 81/(15*6) = 9/10 trees per lumberjack per hour 117/(9/10 * 26) = 5 hours

10	15 [points]	The five starting basketball players for the CBC Hawks scored 95 points in their win last night over their rivals the Yakima Valley Yaks. Assuming the following statements from the five players are true, how many points did Jackson score? Noah: No two of us scored the same number of points. Roman: Tomas was our fourth highest scorer. Aidan: All five of us scored an odd number of points. Tomas: Aidan scored two points more than Roman. Jackson: Noah was our top scorer with 23 points. Knowing that all the point values are odd, all the values are different, the highest is 23, and that they all to 95 leaves only one possible sequence. 15,17,19,21,23. Then we can assign the top value to Noah, the fourth to Tomas, and the only remaining consecutive pair to Aidan and Roman. This leaved only the lowest score of 15 for Jackson.

"Math is Cool" Championships -- 2022-23

4th Grade

College Bowl Round #1 Solutions

	Answer	Solution
1	79	What is the sum of eight and seventy-one? 8+71 = 79
2	50 [%]	When rolling a fair six-sided die, what is the probability in percent of rolling an odd number? 3/6 = 50%
3	8 [vertices]	How many vertices does a cube have? A cube has 8 vertices.
4	34 [pieces}	I have a secret amount of candy pieces. If I add 16 pieces of candy and then divide the candy into five equal groups, there are ten pieces of candy in each group. How many pieces of candy did I start with? Ending amount is 50 pieces. 50 – 16 = 34.
5	182	What is the next term of the arithmetic [PROCTOR – pronounced air-ith-MET-ic] sequence that begins: Two hundred thirty-four, two hundred twenty-one, two hundred eight, one hundred ninety-five, and so on. Subtract 13 each time. 195 – 13 = 182
6	853	Using the digits five, three and eight exactly once each, what is the largest three-digit odd whole number that can be made? 853 > 835
7	25	Jasmin counts up by fives. The seventh number she says is forty. What was the fourth number she said? 7th – 40 6th – 35 5th – 30 4th – 25
8	17	What is the sum of the digits in the number thirty thousand four hundred and eighty two? 30,482 3+4+8+2 = 17
9	1 [unit]	The perimeter of an irregular pentagon is eighteen units. Four of the side lengths are five, five, two and five units. How many units is the length of the fifth side? 18 – 5 – 5 – 2 – 5 = 1

10	400 [$]	What is four hundred and forty-two dollars rounded to the nearest hundred dollars? $442 rounds to $400.

"Math is Cool" Championships -- 2022-23

4th grade

College Bowl Round #2 Solutions

	Answer	Solution
1	4 [jellybeans]	Batman had twenty-eight jellybeans. He gave all of them, except for the four that were red, to his friend Robin. How many jellybeans does Batman have now? He kept the four red ones.
2	31	What whole number is eight point one plus twenty-two point nine? 8.1 + 22.9 = 31
3	50 [meters]	A beach volleyball court is 9 meters wide and 16 meters long. What is its perimeter in meters? 2(9 + 16) = 50
4	75 [%]	A single bracelet is drawn out of a box containing five pink, four blue, and seven green bracelets. As a percentage, what is the probability that the bracelet is **not** blue? 5+4+7 = 16 total 12 are not blue 12/16 = $\frac{3}{4}$ = 75%
5	22	What is the next number in the sequence that begins: one, two, four, seven, eleven, sixteen, and so on? The pattern is +1, +2, +3, … 16 + 6 = 22
6	36	Twenty-four is one-third of twice my favorite number. What is my favorite number? 24 = 1/3(2x) X = 36
7	8 [numbers]	How many even ten-digit positive numbers can be written using only two ones and eight zeros? 1100000000 1010000000 1001000000 1000100000 1000010000 1000001000 1000000100 1000000010

8	8	What is the range of the following list of numbers: nine, four, one, three, seven, two Range = 9 – 1 = 8
9	15 [quarts]	Three gallons and three quarts is equal to how many quarts? 1 gallon = 4 quarts 3*4 + 3 = 15
10	3	What whole number is the product of nine and one-third? 9 x 1/3 = 3

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College Bowl Round #3 Solutions

	Answer	Solution
1	11	What is the mean of the following numbers: three, twenty-five, two, ten and fifteen? 3+25+2+10+15 = 55 55/5 = 11
2	3	What is one minus two plus three minus four plus five? 1-2+3-4+5 = 3
3	144 [square feet]	A square piece of carpet has sides that are 12 feet long. What is the carpet's area in square feet? 12x12 = 144
4	16 [dogs]	At Miriam's Pet Rescue, there are four dogs for every five cats. If there are a total of thirty-six dogs and cats combined, how many dogs are there? 4:5 Increase by a factor of 4: 16:20 = 36 total
5	6 [factors]	How many positive distinct factors does the number 12 have? 1, 2, 3, 4, 6, 12
6	510 [dollars]	If Juan's allowance is fifteen dollars in January, twenty dollars in February, and continues to increase by five dollars every month, how many total dollars will he receive in one year? 15 + 20 + 25 + 30 + 35 + 40 + 45 + 50 + 55 + 60 + 65 + 70 = 510
7	20 [years]	Gino is seven years old, and his father is thirty-four years old. After how many years will Gino be half his father's age? In 20 years, Gino will be 27 and his father will be 54.
8	0 [points]	How many points of intersection do two parallel lines have? Parallel lines do not intersect.
9	5	In the following equation, what is the value of x? Nineteen minus x equals 9 plus x. 19 – 5 = 9 + 5
10	1	Evaluate the following expression: five times five times five divided by one hundred twenty-five. 5x5x5/125 = 1

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College Bowl Round #4 Solutions

	Answer	Solution
1	28	What is the sum of the first five prime numbers? 2 + 3 + 5 + 7 + 11 = 28
2	169 [square units]	What is the area in square units of a square with a side length of 13? 13*13 = 169
3	90000 [numbers]	How many positive five digit whole numbers are there? 10000 – 99999 99999 – 9999 = 90000
4	337 [degrees]	If one interior angle of a parallelogram measures twenty-three degrees, what is the sum in degrees of the other three interior angles? The sum of the interior angles is 360 degrees. 360 – 23 = 337
5	20 [=x + y]	A set of four numbers x, y, thirteen and fifteen has a mean equal to twelve. What is x plus y? (x+y+13+15)/4 = 12 X+y+13+15 = 48 X+y = 20
6	50 [percent]	A single six-sided die is rolled four times, and the results are: five, five, one, three. When the die is rolled a fifth time, what is the probability in percent that the result is an odd number? The probability of an odd number (1, 3, 5) is always 50%.
7	64	A geometric sequence with first term equal to one begins as follows: 1, 2, 4, 8, and so on. What is the seventh term in the sequence? Multiply by 2 each time: 1, 2, 4, 8, 16, 32, 64
8	170 [minutes]	Lyla left home for her baseball game at 4:20 PM and returned home at 7:10 PM the same day. For how many minutes was Lyla away from home? 4:20 pm to 7:20 pm is 3 hours, or 180 minutes. Subtract 10 minutes, because she got home at 7:10 pm.
9	66 [degrees]	Two angles join to form a right angle. The first angle measures 24 degrees. What is the measure of the second angle in degrees? 90 – 24 = 66

10	1	What integer is equal to three-tenths plus seven-tenths? 3/10 + 7/10 = 10/10 = 1

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College Bowl Round #5 Solutions

	Answer	Solution
1	16	What is the quotient of 64 and 4? 64/4 = 16
2	7000 [meters]	How many meters are in seven kilometers? 1 km = 1000 7*1000 = 7000
3	4 [lines]	How many lines of symmetry does a square have? Cutting in half vertically and horizontally, plus the two diagonals.
4	50 [percent]	If a single six-sided die is rolled, what is the probability in percent that the number showing is less than four? Less than four would be 1, 2 or 3. 3/6 = 50%
5	78 [times]	A grandfather clock chimes once at one o'clock, twice at two o'clock, three times at three o'clock, and so on through twelve o'clock. How many total times does it chime in a twelve hour period from one o'clock to twelve o'clock inclusive? Sum of 1 to 12 = (12)(13)/2 = 78
6	13 [numbers]	How many whole numbers between one and forty are divisible by three? 3*1 through 3*13
7	88 [green marbles]	A bag has red and green marbles. The ratio of red to green is three to eight. If there are thirty-three red marbles, how many green marbles are there? Red: 3x11 = 33 Green: 8x11 = 88
8	464 [cents]	Aditi bought a used book costing five dollars and thirty-six cents. He gave the cashier a ten dollar bill. How much change, in cents, did he receive? 1000 – 536 = 464
9	4	What is the mode of the following set of numbers: zero, zero, four, one, four, four. 4 is repeated the most.
10	24 [centimeters]	What is the perimeter in centimeters of a right triangle with side lengths six centimeters, eight centimeters and ten centimeters? 6+8+10 = 24

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College Bowl Round #6 Solutions

	Answer	Solution
1	9 [cm]	In centimeters, what is 35 millimeters plus 55 millimeters? 35 + 55 = 90 millimeters = 9 cm
2	120 [degrees]	In degrees, what is the sum of two of the interior angles in an equilateral triangle? Each angle is 60, 60 + 60 = 120 degrees
3	39	What is the next term in the arithmetic (PROCTOR – pronounced air-ith-MET-ic) sequence that begins: 51, 47, 43, and so on. Subtract 4 each time. 43 – 4 = 39
4	4 [digits]	The number N equals two times two times two times five times five times five. How many digits are in the number N? 2x2x2x5x5x5 = 10x10x10 = 1000
5	3 [ways]	In how many different ways can the letters of the word boom, spelled B-O-O-M, be arranged, if the B must stay in the first position? BOOM BOMO BMOO
6	8 [contestants]	Prisha is in a book-reading contest at the library. Two contestants read the same number of books and tied for first place. Four people finished ahead of Prisha, and three people finished behind Prisha. How many total contestants were in the contest? Four ahead, Prisha, 3 behind. 4 + 1 + 3 = 8
7	80 [%]	A bag contains five red marbles and twenty blue marbles. If one marble is randomly selected, what is the probability in percent that it is not red? Blue = 20/25 = 80/100 = 80%
8	7	What is the median of the following set of numbers: seven, eight, three, eight, three, nine, three 3, 3, 3, 7, 8, 8, 9 The 7 is in the middle

9	7	What whole number is equal to five times seven-fifths? 5 x 7/5 = 7
10	5 [units]	Two congruent squares have a combined area of 50 square units. What is the side length, in units, of one of the squares? Each square's area is 25 square units. 5x5 = 25

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College Bowl EXTRA

	Answer	Solution
1	54 [cubic inches]	What is the volume in cubic inches of a rectangular prism with a length of three inches, a width of two inches, and a height of nine inches? 3*2*9=54
2	20	What is one-fifth of one-hundred? 1/5 x 100 = 20
3	5	What is the mean of the following data set? Seven, four, three, four, seven 7+4+3+4+7=25 25/5 = 5
4	16 [days]	Biff the caterpillar can crawl nine inches in one day. How many days will it take him to crawl four yards? 4 yards = 12 feet = 144 inches 144/9 = 16 days
5	25 [cm^2]	What is the area in square centimeters of a square with a perimeter of twenty cm? 20/4 = 5 cm per side 5 x 5 = 25
6	140	What is the product of thirty-five and four? 35*4 = 140
7	582 [cents]	Sahana has five one-dollar bills, three quarters, and seven pennies. How much money does Sahana have in cents? 500 + 75 + 7 = 582
8	14	Find the next number in the sequence that begins with: One, five, four, eight, seven, eleven, ten, and so on. Pattern is +4, -1. 10+4 = 14
9	3	How many distinct arrangements are there of the letters in the word DAD, spelled D-A-D ADD, DAD, DDA
10	11	What is the positive square root of one hundred twenty-one? Sqrt(121)=11