"Math is Cool" Masters -- 2020-21

5th Grade

Mental Math Solutions

	Answer	Solution
1	99	What is sixty-four plus thirty-five? 64 +35 = 99
2	[¢] 750	Janissa wants to buy five bottles of water. How much, in cents, will Janissa spend if each bottle is one dollar and fifty cents? 150 times 5 = 750 cents.
3	-17	What is the next term in the sequence: 15, 7, -1, -9, … -9 – 8 = -17
4	42 [¢]	If a bunch of seven bananas cost two dollars and ninety-four cents, how many cents is one banana? 294/7 = 42
5	81	Let 'A' represent the number of positive two-digit integers and let 'B' represent the number of positive one-digit integers. What is the value of A – B ? 90 – 9
6	152 [¢]	Riley has three quarters, two dimes, five nickels, and thirty-two pennies. How many cents does she have in all? 75 + 20 + 25 + 32 = 152
7	0	On a coordinate plane, the point with coordinates (2, -3) is translated four units to the left, then five units up. What is the sum of the coordinates of the new point? (2, -3) ➔ (-2, -3) ➔ (-2, 2) -2 + 2 = 0

8	30 [fist bumps]	A state math competition has six final competitors. If each competitor fist-bumps each other competitor once before and once after the competition, how many fist-bumps were exchanged? Each set contains 15 fist bumps.

"Math is Cool" Masters -- 2020-21

5th Grade

Individual Test Solutions

	Answer	Solution
1	54 [Comic-Cons]	Joseph attends an average of 3 Comic-Con events each month. How many Comic-Con events would he attend in 18 months? 18 * 3
2	11 [cups]	The Mad Hatter has a tea party for his "unbirthday". He drinks 15 cups of tea, Alice drinks 13 cups, the March Hare drinks 9 cups, and the Dormouse drinks 7. What is the median number of cups of tea consumed at the party? 7, 9, 13, 15 Median = (9 + 13)/2 = 11
3	103 [cows]	Rancher Bill is counting his cows using his "cowculator". He has three pens of cows. If one pen has 35 cows, another has 25 cows, and the third pen has 43 cows in it, how many total cows does Bill have? 35+25+43 =103
4	280 [apples]	If a crate can hold 70 apples, how many apples can 4 crates hold? 4 times 70 = 280
5	3 [pieces of candy]	Chinmayi has 19 pieces of candy and wants to give an equal number of whole pieces of candy to her 4 friends. How many whole pieces of candy will she have left over when she gives each of her friends the maximum possible equal number of whole pieces of candy? 19 divided by 4 = 4.75 4 times 6 = 16 19-16 = 3

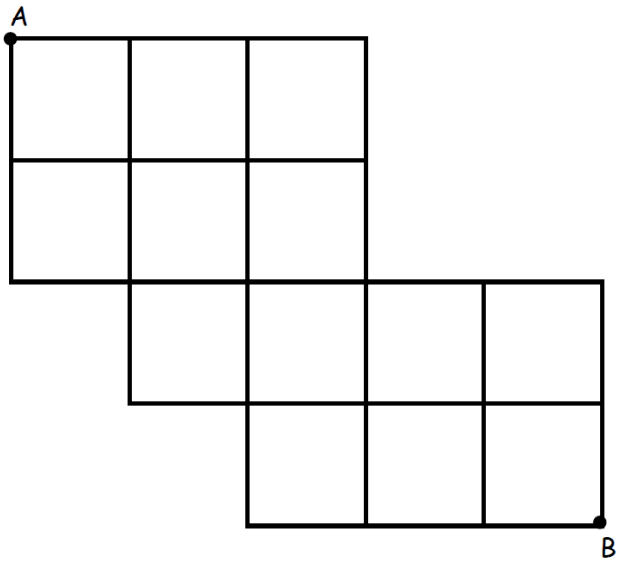
6	21 [balloons]	Sinan had 28 balloons and lost 25% of them during a windstorm. How many does he have left? 28 * 0.25 = 7 28 – 7 = 21
7	548 [cents]	Kayla has $17.46. She went shopping at Maths "R" Us and bought some Tools of Math Construction. She purchased two protractors for $1.19 each, one compass for $3.27 and three rulers for $2.11 each. After her purchase, how many cents does she have left over? 17.46 – 2(1.19) – 3.27 – 3(2.11) = $5.48
8	13	Billy, Bobbie, and Brenda are sharing a pie. Billy ate 1/4 of the pie, Bobbie ate 1/2 of the pie, and Brenda ate 1/6 of the pie. The amount of pie remaining can be written as a reduced common fraction with the form A/B. What is A + B? 1 – 1/4 – 1/2 – 1/6 = 1/12 1 + 12 = 13
9	60 [miles]	On her 18-mile one-way commute to college, 6.5 miles into the trip, Jessica realized she had forgotten her Statics book. She went back home and got it, and started back to college. When she was 3.5 miles from school, she realized she had forgotten her calculator. She went back home and got it. After getting her calculator, she successfully made it to her college. How many total miles did she travel getting to college? 6.5 + 6.5 + 14.5 + 14.5 + 18 = 60
10	9 [rings]	It takes 3.5 ounces of gold to make a ring. How many whole rings can made from two pounds of gold? 2 times 16 = 32 32 divided by 3.5 =9.1428… So 9
11	504 [dozens]	Kumiko's egg factory produces 504 eggs per day. How many dozen eggs does the factory produce in 12 days. 504 * 12 / 12 = 504
12	4 [costumes]	It takes 3/4 of a square yard of material to make a Halloween costume. How many complete costumes can be made with 24 square feet of material? 2/3 of square yard = 6 feet 24/6 = 4

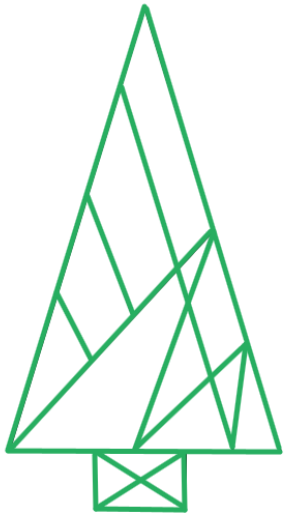
13	199 [minutes]	Dwight argued with his co-worker Jim from 2:44 p.m. until 6:13 p.m. the same day. In the middle of the argument, they took a 10 minute break from arguing while Dwight got his stapler out of the Jell-O. How many minutes did Dwight and Jim spend arguing? 3 hours = 180 minutes, plus an addition 29 minutes = 209 209 total – 10 minute break = 199
14	360 [math problems]	Albert does 30 math problems every Monday, 10 math problems on every day of the week that begin with a "T", and 20 math problems on every day of the week that begins with an "S". How many math problems would he do in 28 days? 30 + 10 + 10 + 20 + 20 = 90 (90)(4 weeks) = 360
15	7 [gallons]	John's new vehicle, a Toyota Prius Eco, can travel 56 miles per gallon of gasoline. John is planning a roundtrip drive to visit his grandmother, who lives 196 miles away. How many gallons of gas will it take for the round-trip journey? 196 * 2 = 392 miles total 392 miles/56 mpg = 7 gallons
16	4	What is 154th letter in the sequence: MATHISCOOLROCKSMATHISCOOLROCKSMAT…. Enter your answer as an integer using the following code: M = 1, A = 2, T = 3, H = 4, I = 5, S = 6, C = 7, O = 8, L = 9, R = 10, K = 11 Only enter the integer as your answer. MATHISCOOLROCKS has 15 letters. The sequence is repeated 10 full times (150 letters). Therefore, the 154th letter will be H.
17	599	The product of 300 positive counting numbers is 300. What is the largest possible sum of the numbers? [Numbers can be repeated] 299 1s + 300 = 599
18	28	The sum of Biff and Eho's age is 63 years. Eho is 7 years older that Biff. Hold many years old is Biff? 28 + 35 = 63

19	52,143 [people]	This year at the Bloomsday 12-kilometer race, Arturo finished in 20,321st place. He was 31,822 places in front of the last-place finisher. How many people ran the race? 20321 + 31822 = 52143
20	73	Tealah opened up her book to start reading again and noticed the product of the two consecutive page numbers where her book was opened up to was 5,402. What is the smallest of the two consecutive page numbers? 73 * 74 = 5402
21	37	On June 1st, both events A and B occurred. If event A occurs every 12 days and event B occurs every 15 days, the first time both events occur on the same day again will be on a particular month and day. Let the month number = C and the day of the month = D. What is C + D? For example, January = 1, February = 2, and so on. 60 days later from June 1st will be July 30th, which is 7/30, so the answer is 7 + 30 = 37.
22	[$] 7	Anthony went to the store to buy accessories for his new Apple iPhone 11. He bought a screen protector, a car charger and a phone wallet. The car charger cost $9 more than the screen protector, and the phone wallet cost $14 more than the car charger. The three items together cost $53. How many dollars does the screen protector cost? 7 + 16 + 30 = 53
23	22 [students]	A group of students are standing equally spaced in a circle. While counting off in sequential order, starting with number 1, the student directly across from student 22 is student 11. How many students are in the circle? If students 11 and 22 are opposite each other then there are 11 students between them. There are 22 in total.
24	19 [days]	Ferny the frog fell into a well 70 feet deep. Each day, Ferny is able to crawl up the side of the well 124 inches. Each night, Ferny slides back down into the well 84 inches. How many days will it take Ferny to reach the top of the well? On average, Ferny moves up (124 – 84 =) 40 inches. Ferny is pretty close after 18 days at 720 inches. On the 19th day, Ferny goes past 840 inches.

25	15	What is the largest possible remainder when a counting number is divided by 16?
26	4	Wayne had lots of friends coming over for dinner, so he decided to double the radius of the circular pizza he normally cooks. How many times bigger is the area of the new larger pizza, compared to the usual sized pizza? If the original pizza has a radius of 1, then the area is pi*12 = pi. Double the radius, and the area of the new pizza is pi*22 = 4pi. It is 4 times larger. The same relationship holds for any sized original pizza.
27	10 [numbers]	Deepesh can only use the numbers 2, 3, 7, 8 and 9. The digits can be repeated. How many distinct 2-digit even numbers can he form? Counting: 5 * 2 = 10 The second digit has to be 2 or 8.
28	73	What number between 1 and 100 has a remainder of 1 when divided by 18 and a remainder of 3 when divided by 5? 73/18 = 4 R1, 73/5 = 14 R3
29	106 [students]	In a survey of the math team members at the Differential School of Geometry, 64 are in the computer programming club, 94 are on the cross-country team and 58 are in band. Also, 28 are part of both computer programing and band, 26 are part of both computer programing and cross-country and 22 are part of both cross-country and band. Additionally, 14 members are involved in three activities. How many students are only in one activity? Draw a venn diagram
30	20 [points]	Will's basketball team is playing a basketball game at Hoopfest. The team that scores 21 points first wins. Will's team scored the first point, then the other team scored two points, then Will's team scored 2 points, then the other team scored 3 points, then Will's team scored 3 points, then the other team 4 points etc. If this pattern continues, what will the score of the losing team when the winning team has 21 points? Can write out the sequences of scores or realize that the other team is always one point behind.

31	50 [seconds]	James is running around a track in the opposite direction as Joe. Joe can run one lap in 1 minute and 15 seconds and meets James every 30 seconds. How long, in seconds, does it take James to run one lap? James runs 30/75 of the track every 30 seconds. At this point, Joe runs 45/75 of the track. Divide that by 30 and you get 50 seconds.
32	48 [miles]	Avisha has ridden her bike 5 miles plus three-fourths the whole distance of the trip, and still has 7 miles to go. How many miles is the whole trip? Write as an equation: 5 + (3/4)x + 7 = x.
33	13	Write the repeating decimal 0.444444… as a reduced common fraction in the form A/B. What is A + B? 4/9, therefore A + B = 13
34	11	Jessica, Owen, Luana, and Will are going to run a race. The probability of Jessica winning is 3/10, the probability of Owen winning is 2/5, the probability of Luana winning is 1/5, and the probability of Will winning is 1/10. On the day of the race, Will was unable to race. The probability that Luana will win the race can be written as a reduced common fraction in the form A/B. What is A + B? P = (1/5)/(9/10) = 2/9 A + B = 11
35	42	The smallest angle between the hour hand and the minute hand on a clock when it is 4:15 pm can be written as A.B, where A is a 2-digit integer and B is a 1-digit integer. What is A + B ? 37.5 degrees A + B = 42
36	60 [bicycles]	The ratio of cars to bicycles in a municipal parking lot is 3:5. After six cars had left, the ratio of cars to bicycles is 1:2. How many bicycles are in the parking lot? Create equation and solve: (3x – 6) / 5x = ½ x = 12 so there are 5 * 12 = 60 bicycles

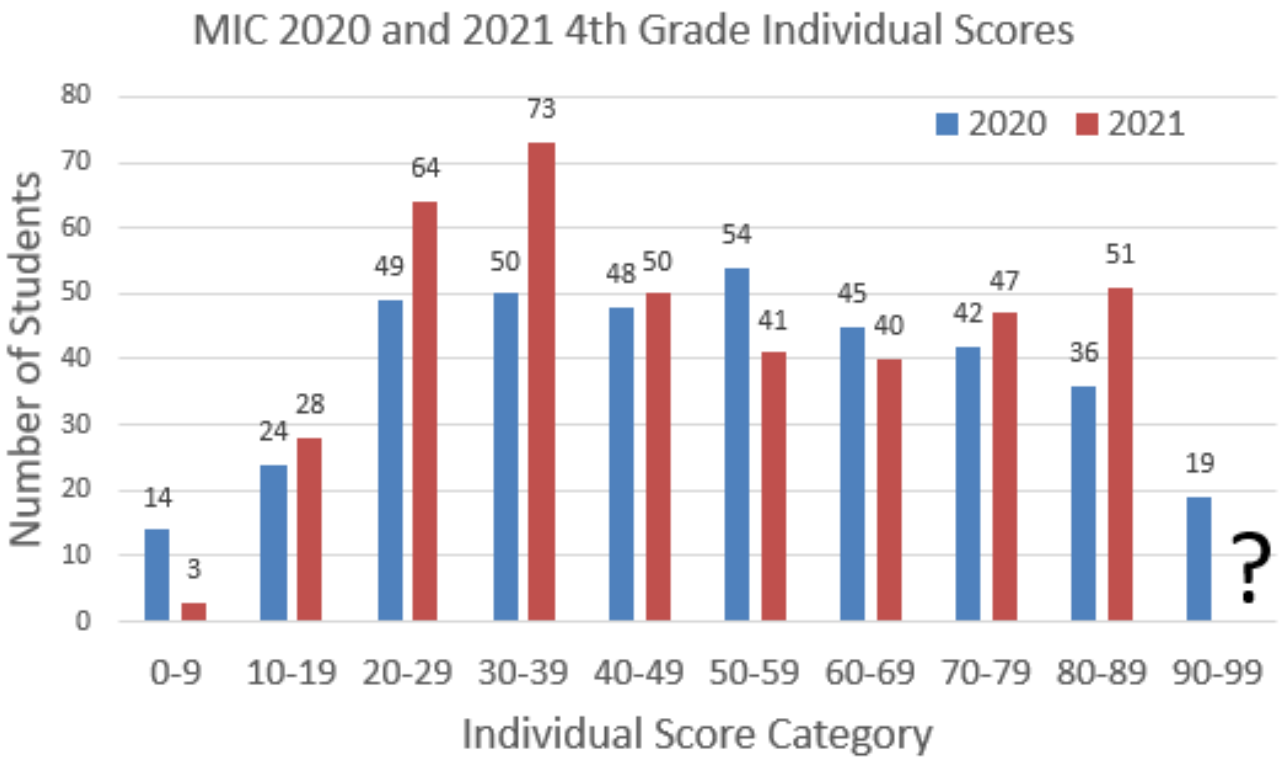
37	96 [paths]	A chicken starts at point "A" and travels to point "B" by only traveling to the right or down along the pathways. How many different paths could the chicken travel while going from point "A" to point "B"?  Use the method shown in the following video: https://www.mathcounts.org/resources/video-library/mathcounts-minis/mini-7-countingpaths-along-grid
38	796	Ermina, Edgar, Elliot and Erika are playing a dice game with a fair 6-sided die. They play in the order their names are listed. Each of them rolls the die one time. If anyone rolls a 4, they are the winner and the game is over. If any number other than a 4 is rolled, the die is passed to the next person until someone rolls a 4. The probability that Erika wins can be written as a reduced common fraction in the form A/B. What is A + B? Erika can win in the scenario where the first three players don't roll a 4 but she rolls a 4. The probability of that is (5/6)^4 * (1/6). Other scenarios where she wins involves looping back to the first player, Ermina. Adding the probabilities together becomes the sum of an infinite geometric series with ratio (5/6)^4. Probability is 125/671, so A + B = 796.

39	27 [triangles]	Count the total number of triangles that can be made from this Christmas tree, including triangles made up of smaller pieces. 19 triangles in tree (6 basic triangles, 5 made from two combined shapes, 3 made from three shapes and 5 made of 4 or more shapes) PLUS, 8 triangles from the tree trunk. (4 basic triangles, 4 triangles made from 2 shapes.) 
40	175	The set of numbers shown here has the same range and mean (average). What is the sum of all possible values of x? The numbers are not necessarily listed in increasing numerical order. {60, 70, 80, 90, x} The two possible values of x are 25 and 150.

"Math is Cool" Masters -- 2020-21

5th Grade

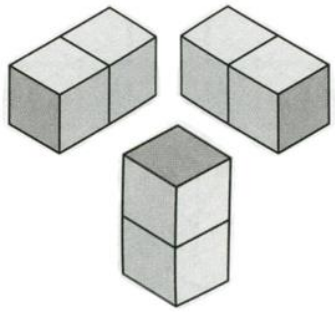
Multiple Choice Solutions

	Answer	Solution
Use the following information for Questions 1-4. In spring of both 2020 and 2021, the Math Is Cool (MIC) 4th grade Championship competitions were held online. The following graph compares the Individual scores for all participants in these two online contests.  		
1	D	In 2020, which scoring category had the highest number of students? A) 20-29 B) 30-39 C) 40-49 D) 50-59 E) Answer not given. **Just look at the values given on each bar.**

2	**C**	The number of students who scored between 90-99 in 2021 was two more than twice the number who scored between 90-99 in 2020. How many total students scored between 90-99 in 2021? A) 19 B) 38 C) 40 D) 46 E) Answer not given. 19*2 + 2 = 40
3	C	How many more students participated in 2021 than in 2020? A) 52 B) 54 C) 56 D)58 E) Answer not given 14+24+49+50+48+54+45+42 +36+19 = 381 3+28+64+73+50+41+40 +47+51+40 =437 437 – 381 = 56
4	B	What is the ratio of the number of students who scored between 30-39 in 2021 to the number of students who scored between 30-39 in 2020? Round off your answer to one decimal place. A) 1.3 B) 1.5 C) 1.8 D) 1.9 E) Answer not given. 73/50 = 1.46 = 1.5

Use the following information for Questions 5-7.

Examples of NOT unique arrangements



Unique arrangements of cubes can be made by following these rules:

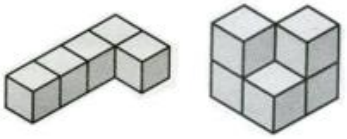
1) Each cube in an arrangement must completely touch at least one other cube face to face. Therefore, no one-cube arrangements are possible, and there are no partial face to face arrangements.

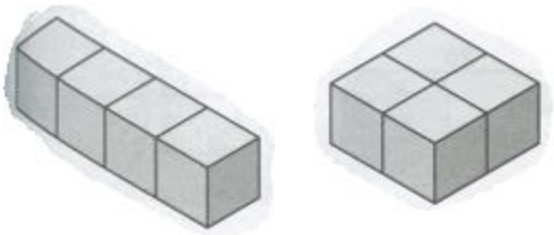
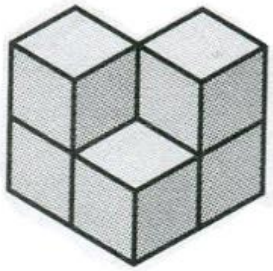
2) For an arrangement to be unique, it must be different from other arrangements even if it is flipped and/or rotated in any direction. For example, the three arrangements shown at the top right are the same, so they are not unique.

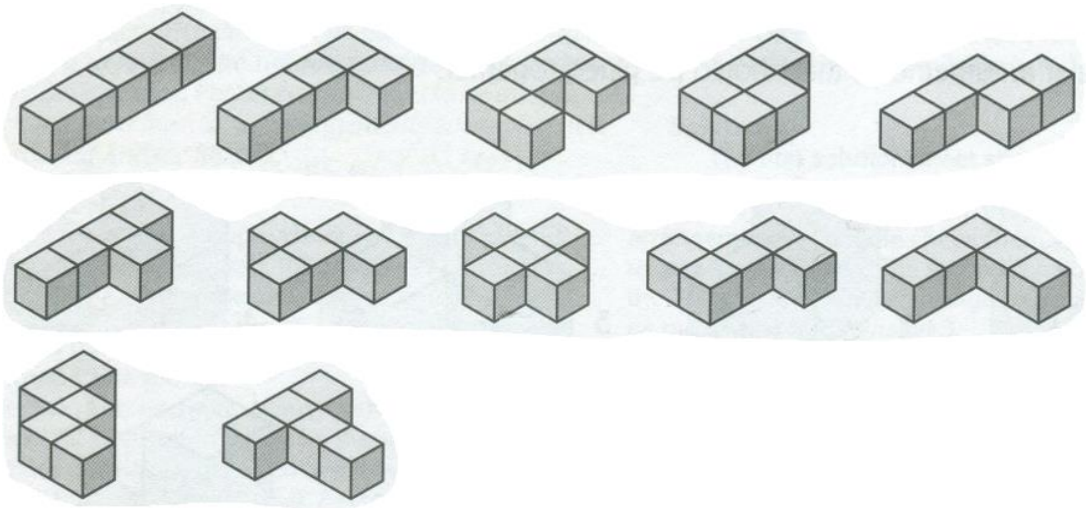
There are two types of arrangements, rectangular and non-rectangular. Rectangular arrangements consist of cubes that form a rectangular prism. Non-rectangular arrangements include any shapes that are not a rectangular prism. See the examples shown at the bottom right.

Rectangular:

Non-Rectangular:



5	B	Using four cubes, how many unique rectangular arrangements are possible? A) 1 B) 2 C) 3 D) 5 E) Answer not given. Four cubes in a row, or four cubes forming a square. 
6	D	Each side length of an individual cube is 1 centimeter. What is the total exposed surface area, in square centimeters, of this non-rectangular arrangement composed of 5 cubes? Include the bottom surface in the calculation.  A) 19 cm^2 B) 20 cm^2 C) 21 cm^2 D) 22 cm^2 E) Answer not given. 5*6 – 8 = 22 30 total faces, but 8 of them are not exposed.

7	D	Using five cubes, how many unique arrangements are possible, if all of the cubes must be lying on the same surface (in other words, no stacking of cubes is allowed). Include both rectangular and non-rectangular arrangements. A) 9 B) 10 C) 11 D) 12 E) Answer not given. 

Use the following information for Questions 8-10.

Some positive integers can be obtained by summing a certain number of consecutive whole numbers. Remember that the set of whole numbers is {0, 1, 2, 3, …}.

For example, there are two ways to obtain a sum of 6 by adding consecutive whole numbers:

Adding 3 consecutive whole numbers: 1 + 2 + 3 = 6

Adding 4 consecutive whole numbers: 0 + 1 + 2 + 3 = 6

Consecutive means "in a row", and inclusive means "including the given end points".

8	B	How many ways can a sum of 7 be obtained by adding at least two consecutive whole numbers? A) 0 B) 1 C) 2 D) 3 E) Answer not given. 3 + 4

9	E	How many ways can a sum of 15 be obtained by adding at least two consecutive whole numbers? A) 0 B) 1 C) 2 D) 3 E) Answer not given. 4 ways: 7 + 8 4 + 5 + 6 1 + 2 + 3 + 4 + 5 0 + 1 + 2 + 3 + 4 + 5
10	C	How many integers from 1 to 25, inclusive, CANNOT be obtained by adding at least two consecutive whole numbers? A) 2 B) 3 C) 4 D) 5 E) Answer not given. The integers that cannot be obtained are the powers of 2: 2, 4, 8, 16.

"Math is Cool" Masters -- 2020-21

5th Grade

Team Test Solutions

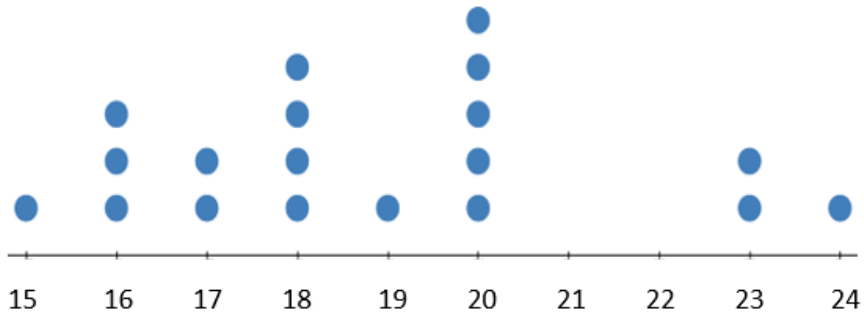
	Answer	Solution
1	121 [strawberries]	At the U-Pick strawberry orchard, Aditi picked 142 strawberries and Rizwan picked 53 strawberries. They ate some strawberries on the way home. When they got home, they had 74 strawberries left. How many strawberries did they eat on the way home? 142 + 53 - 74
2	61	What is 2021_3 as a base 10 number? Do not include the base 10 in your answer. 2 * 27 + 0 * 9 + 2 * 3 + 1 * 1
3	225 [square yards]	Farmer Seth is making a rectangular pen for his pet pig using a total of 60 yards of fencing. What is the largest possible area of the pen? Largest area is a square, so divide 60 by 4, then square it.
4	19 [boxes]	Eho is buying new flooring tiles for his kitchen. His kitchen is 16 feet by 17 feet. Each box of tiles contains 15 tiles, which each measure 1 foot by 1 foot. Partial boxes are not sold. How many boxes of tiles will Eho need to complete his project? 16x17 = 272 272/15 = 18r2 Needs 19 boxes.
5	3456[cubic inches]	Alex buys 4 wood planks. If each of the wood planks measure 6 feet by 6 inches by 2 inches, how many cubic inches of wood did she buy? 4 * (6 * 12) * 6 * 2
6	8	Lisa bought a gift for $48. With tax she paid $51.84. Lisa paid T% sales tax. What is T? Use long division.

7	76 [square feet]	A rectangular swimming pool is going to be built with a 2 feet wide concrete border. If the pool's length is 9 feet and its width is 6 feet, what is the area of the border in square feet? Subtract the area of the rectangle without the border (9 by 6 feet) from the area of the rectangle including the border (13 by 10 feet).
8	18	In a triangle with integer side lengths, one side is twice as long as another side, and the length of the third side is 12. What is the positive difference between the greatest possible perimeter of the triangle and the least possible perimeter of the triangle? Three sides are x, 2x, 12. Using Triangle inequality theorem, 4 < x < 12 For the maximum perimeter, x = 11, 2x = 22, 3rd side = 12. For the minimum perimeter, x = 5, 2x = 10, 3rd side = 12. 45 – 27 = 18
9	547560	Laptop serial numbers have 5 characters, starting with two letters and ending with three digits. If no two consecutive digits can be the same, how many possible serial numbers are there? Total combinations: 26^2 * 10^3 Cases where 3 consecutive digits are the same: 10 Cases where 2 consecutive digits are the same: 2 * 10 * 9 Serial numbers = 26^2 (10^3 – 10 – 2 * 10 * 9)
10	8031	A is the sum of the following infinite geometric series: 16, 8, 4, 2, 1, … B is the 2021st term of the following arithmetic sequence: -17, -13, -9, -5, … What is B – A? A = 16 / (1 – 1/2) = 32 B = 8063 B – A = 8031

"Math is Cool" Masters -- 2020-21

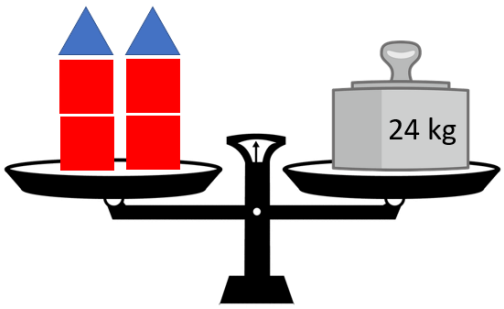
5th Grade

Linda Moore Triple Jump Solutions

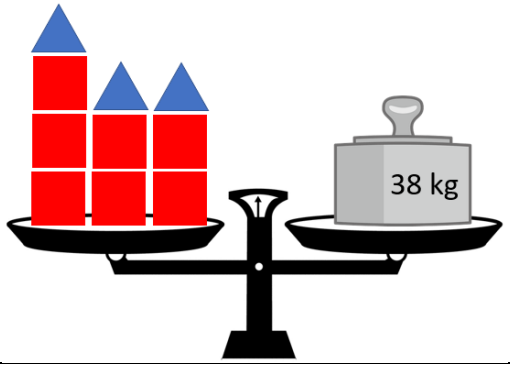
	Answer	Solution
1	8 [$]	Biff bought a shirt and pair of pants for a total of $32. He paid 3 times as much for the pants as he did the shirt. How much did he pay for the shirt in dollars? 8 + 24 = 32
2	360 [sq. inches]	Four rectangles each have a width of 3 inches. Their lengths are 15, 25, 35 and 45 inches respectively. What is the sum of the areas of the four rectangles, in square inches? Add the lengths: 15+25+35+45 = 120 inches 3x120 = 360 sq. inches
3	32 [cm]	A 6 centimeter by 10 centimeter rectangular piece of paper has a 2 centimeter by 2 centimeter square cut out from each corner. After the corners of the paper have been removed, what is the perimeter, in centimeters, of the remaining figure? After removing the 2x2 square from each corner, the remaining sides will be 2 cm and 6 cm, so 8*2 = 16. Plus, there are also 8 2-cm cutout portions. Total = 16.
4	18	The following dot plot shows quiz scores in Mrs. Stephenson's Statistics class. What is the median of these scores?  If you list them in order, the 10th value is exactly in the middle, which is the median.

5	20 [cm]	Packard and Tim divided an extra-long Tootsie Roll in a 3:2 ratio. If Packard's piece was 4 cm longer than Tim's, how long was the entire Tootsie Roll, in centimeters? 3:2 6:4 12:8, this one works because 12 is 4 more than 8. Total length is 12 + 8.
6	3	Find the sum of all prime numbers between 0 and 100 which have a remainder of 3 when divided by 15. The only one is 3, because 3/15 = 0 R 3.
7	42	How many integers between 100 and 200 are multiples of 3 or 7? There are 33 multiples of 3. There are 14 multiples of 7. Subtract off the 5 multiples of 21. 33+14-5 = 42.
8	106 [lbs]	A farmer is preparing for spring planting of his barley crop. Size of seed and seed density changes from year to year as well as the number of viable seeds that will sprout and produce a plant in the field. After running soil tests, the farmer has determined that 95% of the seeds will sprout. There are 14400 seeds in 48 pounds of barley seed. His goal is to have 30,210 sprouting seeds per acre. How many pounds of barley seed per acre should the farmer plant to achieve his goal? Needs to plant 30210/0.95 = 31800 seeds per acre. Set up a ratio: 14400/48 = 31800/x x = 106 lbs

<table>
<tr>
<td>9</td>
<td>2 [kg]</td>
<td>In the following diagram, both scales are evenly balanced. All red squares weigh the same amount, and all blue triangles weigh the same amount. What is the weight of one red square, in kilograms?

Could try guess and check. Or, can solve with algebraic equations:
4S + 2C = 24
7S + 3C = 38

 
</td>
</tr>
<tr>
<td>10</td>
<td>15 [combinations]</td>
<td>The math team at Walkertown Elementary School is having a pizza party to celebrate their successful year of competitions. They need a minimum of 12 pizzas, but can only spend a maximum of $96. Pizzas from Keno's Pizza cost $6 for cheese and $12 for meat lovers. How many different combinations of pizza orders could they place?

<table>
<tr><th>meat lovers</th><th>cheese</th><th>total $</th><th>total no.</th></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>8</td><td>96</td><td>12</td></tr>
<tr><td>3</td><td>9</td><td>90</td><td>12</td></tr>
<tr><td>3</td><td>10</td><td>96</td><td>13</td></tr>
<tr><td>2</td><td>10</td><td>84</td><td>12</td></tr>
<tr><td>2</td><td>11</td><td>90</td><td>13</td></tr>
<tr><td>2</td><td>12</td><td>96</td><td>14</td></tr>
<tr><td>1</td><td>11</td><td>78</td><td>12</td></tr>
<tr><td>1</td><td>12</td><td>84</td><td>13</td></tr>
<tr><td>1</td><td>13</td><td>90</td><td>14</td></tr>
<tr><td>1</td><td>14</td><td>96</td><td>15</td></tr>
<tr><td>0</td><td>12</td><td>72</td><td>12</td></tr>
<tr><td>0</td><td>13</td><td>78</td><td>13</td></tr>
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<tr><td>0</td><td>15</td><td>90</td><td>15</td></tr>
<tr><td>0</td><td>16</td><td>96</td><td>16</td></tr>
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"Math is Cool" Masters -- 2020-21

5th Grade

College Bowl Round #1 Solutions

	Answer	Solution
1	24 (parts)	Yazmin is making coffee. In every batch, she uses two parts sugar and three parts creamer. How many parts of sugar will she need if she uses 36 parts creamer? Set up a ratio 2/3 = x/36
2	39	A drawing has 6 pentagons and 3 triangles. None of the figures are touching each other. How many total sides are in the drawing? A pentagon has 5 sides and a triangle has 3 6*5 + 3*3
3	8	How many counting numbers are factors of forty-two? 1, 2, 3, 6, 7, 14, 21, 42
4	16,200 (seconds)	How many seconds are in $4\frac{1}{2}$ hours? Multiply 4.5 by 60, then by 60 again.
5	12 (ways)	Sally, Allie, Dally and Riley are at the movie theatre. How many ways can they seat themselves in a row of four seats if Dally and Allie have to sit together? Think of it as 3 seats: 3! = 6. Dally and Allie can swap spots, so multiply by 2.
6	64	What is the smallest integer greater than one that is both a perfect square and a perfect cube? 8 x 8= 64 4 x 4 x 4 = 64
7	9	How many diagonals can be drawn in a regular hexagon? Can sketch it, or use the formula: n(n-3)/2, where n = 6.
8	3	How many of the numbers in the following set are prime?: 18, 4, 2, 5, 9, 19, 14 2,5, and 19 are prime.

9	29	Tim is 11 years old. Jennifer is 22 years old. How old will Tim be when Jennifer is 40? Jennifer turns 40 in 18 years, add 18 to 11
10	21 [pages]	Vishal reads all the pages in a chapter of a book, starting at the top of page 40 and ending at the bottom of page 60. How many pages did Vishal read? There are 21 numbers between 40 and 60 inclusive.

"Math is Cool" Masters -- 2020-21

5th Grade

College Bowl Round #2 Solutions

	Answer	Solution
1	21	What number is exactly halfway between 13 and 29? There are 16 numbers between 13 and 29, divide by two to get halfway and add 8 to 13.
2	17	What is the largest prime factor of 85? 85=5*17
3	12	What is the area of a right triangle with legs 4 and 6? Area of a Right Triangle: $\frac{1}{2}$ base * height
4	23	Melody is thinking of a number. If she triples the number and subtracts seventeen, she gets 52. What is her number? The equation is: 3x -17 = 52
5	6	Angie is taller than Benji, Carlie is shorter than Don, and Evie is between Carlie and Frankie in height. Benji is taller than Frankie, Sally is taller than Don, and Carlie is taller than Frankie. Who is the shortest in this group? Your answer should be an integer: Angie = 1, Benji = 2, Carlie = 3, Don = 4, Evie = 5, Frankie = 6 Make a line of the people. Frankie is the shortest.
6	57	The sum of two consecutive odd numbers is 116. What is the smaller of the two numbers? x+ x + 2 = 116
7	129 [degrees]	What is the measure, in degrees, of the angle that is supplementary to a 51 degree angle? 180-51=129

8	28	What is the sum of the five smallest prime numbers? **2+3+5+7+11**
9	-19	What is the sum of X and Y in the following arithmetic sequence? 4, 1, -2, -5, X, Y The pattern is subtract 3. -8 + (-11) = -19.
10	13	Yulia takes five math tests. Her scores are as follows: 85, 90, 93, 90 and 98. What is the range of her scores? 98-85=13

"Math is Cool" Masters -- 2020-21

5th Grade

College Bowl Round #3 Solutions

	Answer	Solution
1	4 (hours)	Stephen is going to drive his golf cart 48 miles to a Billie Eilish concert. He drives at a speed of 12 miles an hour. How many hours will it take him to get to the concert? Divide 48 by 12
2	90	If A equals 8 and B equals 13, evaluate the expression: $A^2 + 2B$. $8^2 + 2(13) = 90$
3	1080 [cubic inches]	A toolbox has a length of 20 inches, a width of 6 inches, and a height of 9 inches. What is the volume of the toolbox in cubic inches? The formula for volume is length * width *height 20*6*9
4	6 [= x]	Solve for the value of x in the following equation: 17x + 8 = 110 Subtract 8 from both sides, divide by 17
5	145 (squares)	A square checkerboard has 17 rows and 17 columns of congruent squares, alternating black and white. If at least one corner square is black, how many of the squares are black? 17x17= 289 289/2= 144.5 at least one corner is black - 145
6	32 [cents]	Zimeng has six standard U.S. coins in his pocket. If he has no more than two of any type of coin, what is the smallest number of cents he could have in his pocket? 2 pennies, 2 nickels, 2 dimes **2+10+20**

7	275 [minutes]	Rebecca fell asleep at 2:38 pm and took a nap until 7:13 pm on the same day. How many minutes did she sleep? 4 hours + 35 minutes **240 + 35**
8	1	What is the remainder when 267 is divided by 7? 267/7= 38 r 1
9	5 [May]	During a leap year, in which month does the 123rd day of the year occur? Answer as an integer according to the month number: January = 1, February = 2, and so on. 31 + 29 + 31 +30 = 121 days; next month is May, which will contain the 123rd day.
10	16	How many multiples of 9 are there between 1 and 150? **150/9 = 16 r 6**