Use global search and replace to change the following variables.

--- Done by Test Writer ---

Year: 2019-2020 → 2018-19

Grade: 6th Grade → 6th Grade, 7th Grade, 8th Grade
Check to make sure it has the proper grade or 'Middle School' as appropriate

Champs: Championships → Championships or Masters
For the individual, delete 41-45 on answer sheet and problems.

--- Done by Site Coordinator ---

Date: #date → October 20, 2018

Sponsor: #sponsor → Sponsor SoSoBank or to blank

“Math is Cool” Championships – 2019-2020

#sponsor

#date

6th Grade Mental Math Contest

Follow along as your proctor reads these instructions to you. Your Mental Math score sheet is on the back.

GENERAL INSTRUCTIONS applying to all tests:

- *Good sportsmanship is expected throughout the competition by <u>all</u> involved, both competitors and observers. Display of poor sportsmanship may result in disqualification.*
- *Calculators or any other aids may not be used on any portion of this contest.*
- *Unless stated otherwise, all rational, non-integer answers need to be expressed as reduced common fractions except in case of problems dealing with money. In the case of problems requiring dollar answers, answer as a decimal rounded to the nearest hundredth (ie, to the nearest cent).*
- *All radicals must be simplified and all denominators must be rationalized.*
- *Units are not necessary as part of your answer unless it is a problem that deals with time and in that case, a.m. or p.m. is required. However, if you choose to use units, they must be correct.*
- *Leave all answers in terms of π where applicable.*
- *Do not round any answers unless stated otherwise.*
- *Record all answers on the colored cover sheets in the answer column only.*
- *Make sure all answer sheets have all the information (name, team number, etc.) at the top of the sheet filled out.*
- *Tests will be scored as a 0 if answers are not recorded on the answer sheets.*
- *Blank answer sheets and answer sheets with no name will be scored as a 0.*

<u>Mental Math</u> – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

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/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

Final Score:

(Out of 8)

"Math is Cool" Championships -- 2019-2020

School:_____Room # _____ Team #_____

Name: _____Proctor: _____

6th Grade Mental Math – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

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/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			

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6th Grade – #date

Mental Math Contest

Mental Math – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

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/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

#	Problem
1	What is eighty times twelve?
2	How many distinct ways are there to arrange the letters in the word READ, spelled R-E-A-D?
3	The area of a rectangle is ninety-five square inches and the length is nineteen inches. What is the number of inches in the height of the rectangle?
4	What is one-third of one-sixth of fifty-four?
5	Let N equal the number of sides in a hexagon. What is N squared?
6	What is the positive difference between twenty-five squared and fifteen squared?
7	What is the slope of the line with coordinates eight comma three and four comma two?
8	Jim can sell forty-eight pens in one hour. It takes Pam one-third of the time to sell the same number of pens. In minutes, how long does it take Pam to sell sixty pens?

Final Score:

KEY

(Out of 8)

"Math is Cool" Championships -- 2019-2020

School:_____Room # _____ Team #_____

Name: _____Proctor: _____

6th Grade Mental Math – 30 sec per question

8 problems read orally to everyone - Approximately 8% of Individual Score - 25% of team score

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/her pencil down, the maximum wait time is 30 seconds after completion of the second reading of the question before another question is asked. You may continue to work on a problem while the next question is being read. The value of each question is a one or zero. Each student will be asked the same eight questions. Individual scores used to determine individual placing will be determined by the sum of the Mental Math score and the Individual Test score for each individual. In addition, the top three Mental Math scores from one team will be totaled and doubled and will contribute to 25% of the team score.*

	Answer
1	960
2	24 [ways]
3	5 [inches]
4	3
5	[N^2 =] 36
6	400
7	1/4
8	25 [minutes]

“Math is Cool” Championships – 2019-2020

#date

Total # Correct:

STUDENT NAME: _____ **School Name:** _____

Circle Math: **Pre-Algebra** **Algebra 1** **Geometry** Team #: _____ Room #: _____

6th Grade Individual Contest – Score Sheet
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:			

6th Grade

“Math is Cool” Championships – 2019-2020

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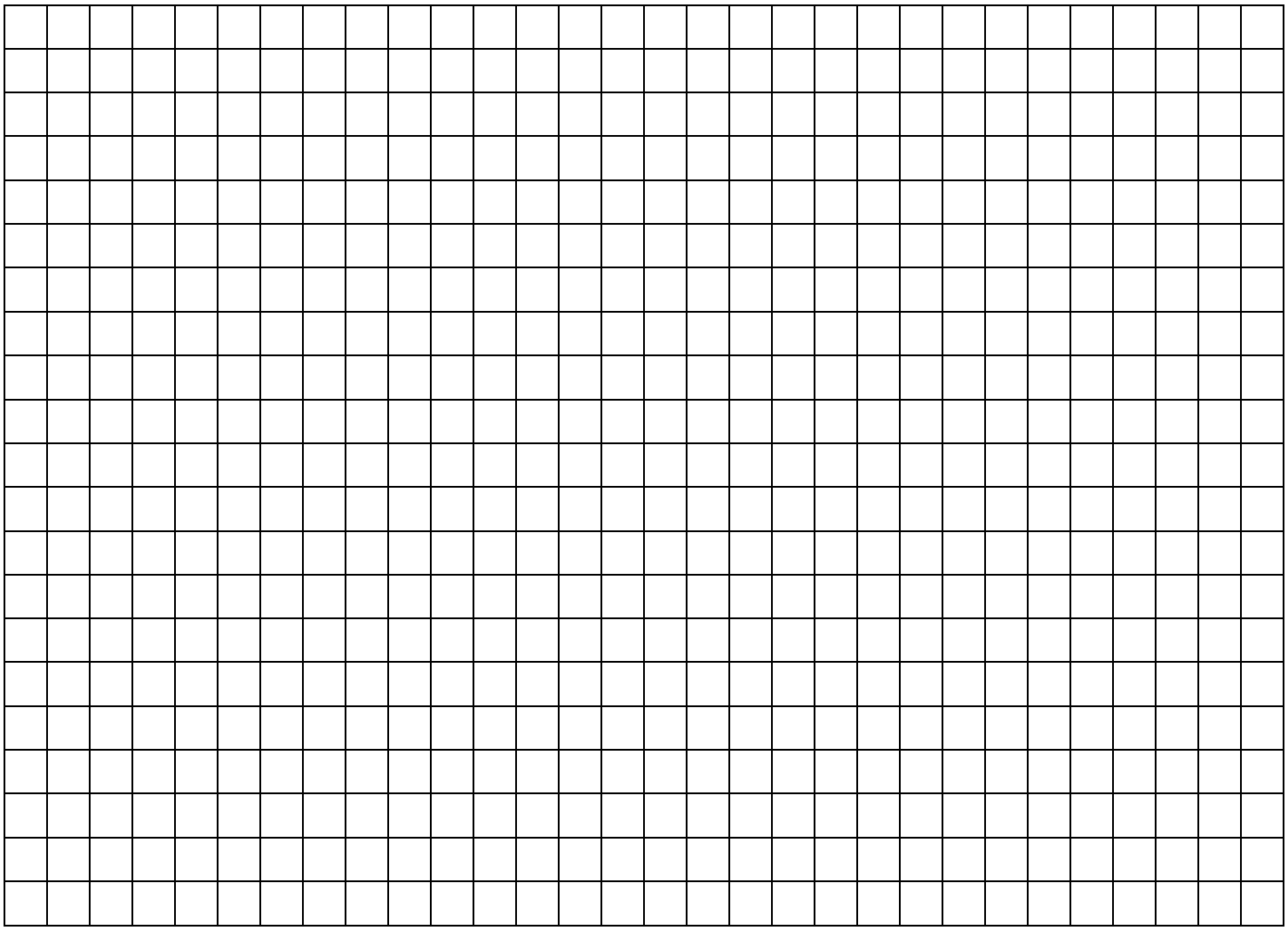
#date

6th Grade Individual Contest

Tear this cover sheet and scratch paper off and fill out the top of the colored answer sheet prior to the start of the test. The graph below is for your use, if needed.

INDIVIDUAL TEST - 35 minutes

You may NOT be seated next to anyone from your school. If you are MOVE NOW to avoid being disqualified! When you are prompted to begin, tear off the colored sheet and begin testing. Make sure your name and school are recorded on the answer sheet. The raw score will be 2 points for correct answers to problems 1-30 and 3 points for 31-40. Record your answers on the score sheet. No talking during the test. You will be given a 5 minute time warning.



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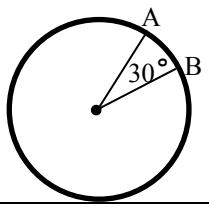
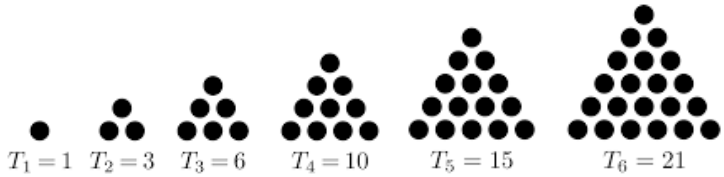
#date

6th Grade Individual Contest

	Questions 1-30: 2 points each
1	Meghan makes 90% of her free throws. At this rate, how many will she miss if she shoots 130 free throws?
2	Every time Martha hiccups, she increases her favorite number by 5. Right now, her favorite number is 7. What will her favorite number be after she hiccups 17 times?
3	A recipe that calls for 4 cups of flour yields 16 cinnamon rolls. How many cups of flour are needed to make 20 cinnamon rolls?
4	What is 21 squared?
5	Solve the equation for x: $3x - 7 = 7x + 1$
6	One tablespoon of olive oil is mixed with one tablespoon of balsamic vinegar. A second tablespoon of olive oil is mixed with one tablespoon of lemon juice. The two mixtures are combined. What percent of the combined mixture is balsamic vinegar?
7	What is 325602356 + 571092242?
8	Let $D = r \cdot t$. What is the value of D if r = 7 and t = 17?
9	Evaluate: $7!$
10	What is the number of distinct prime factors of 2020?
11	A triangle has three angles, whose measures are 33˚, 54˚, and 93˚. What is the degree measure of the largest angle in a similar triangle whose sides are 10 times as long as the sides of the first triangle?
12	A regular polygon has 23 sides that are equal in length. If the perimeter of the polygon is 506 inches, what is the number of inches in the length of each side?
13	The perimeter of a square is 80 centimeters. What is the number of square centimeters in the area of the square?
14	What is the next term in the following sequence? 1, 1, 2, 3, 5, 8, . . .
15	What is the average of the digits in the phone number 867-5309 as a common fraction?
16	What is 5,300,000,000 in scientific notation with the decimal part rounded to the nearest tenth?

17	The circumference of a circle is 14π centimeters. In terms of π, what is the number of square centimeters in the area of the circle?
18	What is the product of the smallest 5 composite numbers?
19	What is the remainder when 16561 is divided by 131?
20	A piece of paper is 8.5 x 11 inches. As a common fraction, what is the number of square feet in the area of the piece of paper?
21	When my number is divided by 9, the remainder is 6. When it is divided by 7, the remainder is 5. When it is divided by 5, the remainder is 1. What is the smallest possible number my number could be?
22	It is 180 miles from Seattle to Moses Lake. It takes Tulsi 2.5 hours to make the trip. What is Tulsi's average rate in yards per minute? Hint: there are 5280 feet in a mile and 3 feet in a yard.
23	A sample of bitter almond oil has a mass in grams that consists of 65% benzaldehyde. If the sample contains 50 grams of benzaldehyde, what is the number of grams in the total mass of the sample, rounded to the nearest whole gram?
24	Let y = kx. As a common fraction, what is the value of k if x = 10 and y = 5?
25	What is the number of units in the length of a segment whose endpoints have coordinates (-7, -3) and (17, 4)?
26	The circumference of a circle is 2π centimeters. A central angle has a measure of 30˚ and it intercepts $\widehat{AB}$ as shown. In terms of π and as a fraction in lowest terms, what is the number of centimeters in the length of $\widehat{AB}$? 
27	The population of a certain strain of bacteria doubles every 4 hours. If the bacteria population starts out consisting of 3 cells, then what is the number of cells in the population after 24 hours?
28	As a common fraction, what is the probability that you roll a sum of 7 when you roll 3 standard 6-sided dice?
29	When three different one-digit numbers are multiplied, the product is 60. Each of the three one-digit numbers is then increased by 5 and these new larger numbers are multiplied together. What is the sum of all possible products that could result from this process?
30	What is the number of degrees in the smaller angle formed by the hour hand and the minute hand at 12:26 pm on an analog clock?

Challenge Questions: 3 pts each

31	The first six triangular numbers are shown below. What is the 15th triangular number? 
32	Marianne wants to pour a concrete slab in the shape of a rectangular prism that is 96 in x 81 in x 6 in. How many cubic yards of cement does she need?
33	Tim can paint a fence in 16 hours. When he works together with Tom, it takes 4 hours. In minutes, how long would it take Tom to paint the fence by himself?
34	What is the number of square inches in the area of a square inscribed in a circle of radius 7 inches?
35	How many different 7-digit telephone numbers are possible if the first 3 digits cannot make the three-digit number 911 and the first digit cannot be 0?
36	In terms of π, what is the number of cubic inches in the volume of a hemisphere (half of a sphere) with a base area of 9π in^2. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$.
37	A three-digit base-d number can be written in the form abc_d. The number of possible three-digit base-d numbers depends on the value of d. As a decimal to the nearest tenth what is the mean number of three-digit base-d numbers for $2 < d < 11$?
38	What is the number of square units in the area of quadrilateral ABCD with vertices whose coordinates are A(5, 8), B(9, 7), C(11, 2), and D(2, 2)?
39	As a camp for racquet sports, instruction is offered in tennis, racquetball, and badminton. There are 60 campers, all of whom receive instruction in at least one sport. Thirty-eight campers have instruction in tennis, 42 campers have instruction in racquetball, and 42 campers have instruction in badminton. What is the smallest number of campers who could receive instruction in all three sports?
40	When 3 + 2 ^ 4 is entered on a regular calculator, the result is 19, because $3 + 2 \cdot 2 \cdot 2 \cdot 2 = 19$. On a broken certain broken calculator, the functions of the + and the ^ buttons are reversed so 3 + 2 ^ 4 = $3 \cdot 3 + 4 = 9 + 4 = 13$. Let A, B, and C represent distinct positive single-digit integers. What is the number of distinct ordered triples (A, B, C) such that A + B ^ C = 10 on the broken calculator?

"Math is Cool" Championships – 2019-2020

#date

Total # Correct:

KEY

STUDENT NAME: _____ **School Name:** _____

Proctor Name: _____ Team #: _____ Room #: _____

6th Grade Individual Contest – Score Sheet

DO NOT WRITE IN SHADED REGIONS

	Answers
1	13 [free throws]
2	92
3	5 [cups]
4	441
5	[x =] -2
6	25 [%]
7	896694598
8	[D =] 119
9	5040
10	3 [prime factors]
11	$93^{[\circ]}$
12	22 [inches]
13	400 [cm^2]
14	13
15	38/7

	Answers
16	5.3×10^9
17	49π [cm^2]
18	17280
19	55
20	187/288 [ft^2]
21	96
22	2112 [yards per minute]
23	77 [grams]
24	[k =] 1/2
25	25 [units]
26	$\pi/6$ [cm] or $1/6\ \pi$
27	192 [cells]
28	5/72
29	1490
30	$143^{[\circ]}$

	Answers
31	120
32	1 [yd^3]
33	320 [minutes]
34	98 [in^2]
35	8990000 [phone numbers]
36	18π [in^3]
37	329.5 [three-digit base-d numbers]
38	36 [$units^2$]
39	2 [campers]
40	14 [ordered triples]

6^{th} Grade

Math is Cool" Championships – 2019-2020

6th Grade – #date

Final Score:

Student Name _____

Proctor Name _____ Room # _____

First Score
(out of 20)

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 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. ***Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.***

DO NOT WRITE IN SHADED REGIONS

Answer		-1, 0 or 2	-1, 0 or 2
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

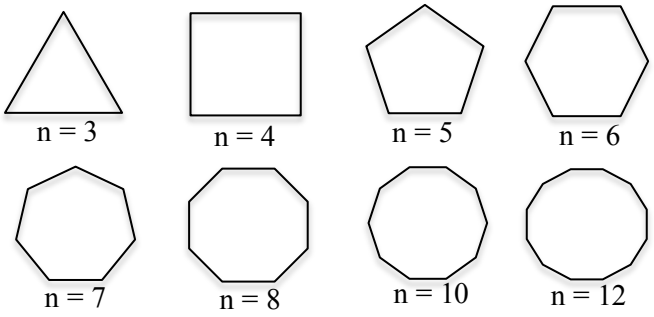
"Math is Cool" Championships – 2019-2020

#sponsor

6th Grade – #date

Team Multiple-Choice Contest

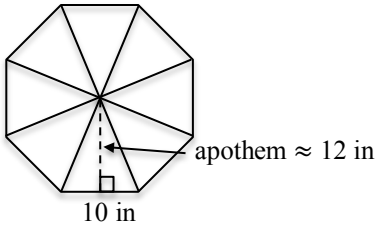
Refer to the following polygons for problems 1-4.
The variable n stands for the number of sides in each polygon. Each figure is a regular polygon, and the word regular means the sides of a given polygon are equal in length and the interior angles of a given polygon are equal in measure.



1 If the side length of the 4-sided polygon is 13 inches, what is the area of that polygon?
A) 26 in^2 B) 52 in^2 C) 156 in^2 D) 169 in^2 E) 196 in^2

2 If the side length of the 3-sided polygon is 11 inches and the side length of the 6-sided polygon is 12 inches, what is the ratio of the perimeter of the 6-sided polygon to the perimeter of the 3-sided polygon?
A) 11:12 B) 11:24 C) 12:11 D) 18:14 E) 24:11

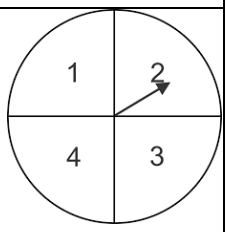
3 The octagon can be divided into 8 congruent isosceles triangles as shown. The height of each of the triangles is called the apothem. If the side length of the octagon is 10 inches and the length of the apothem is approximately 12 inches, then the approximate area of the octagon can be calculated by finding the area of one of the triangles and then multiplying by the number of sides, or $\frac{10 \cdot 12}{2} \cdot 8 =$ 480 in^2. Using this same method, what is the approximate area of the 12-sided shape if the side length is 4 inches and the length of the apothem is approximately 7.5 inches?



A) 90 in^2 B) 180 in^2 C) 270 in^2 D) 360 in^2 E) 720 in^2

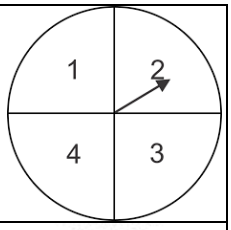
4 The approximate length of the apothem for the pentagon (n = 5) is 5.5 inches and the approximate length of the apothem of the heptagon (n = 7) is 10.4 inches. Using these approximate values, the ratio of the area of the pentagon to the area of the heptagon is 55:182. What is the ratio of the side length of the pentagon to the side length of the heptagon?
A) 4:5 B) 5:4 C) 52:130 D) 55:104 E) 55:182

Refer to the following information for problems 5 – 7.
In a probability experiment, the expected value is the sum of the products of each outcome of the experiment multiplied by their probabilities. Consider a probability experiment involving the spinner shown. Each section of the spinner is the same area so the probability of each number on the spinner is 1/4. Therefore, the expected value of one spin of the spinner is $\frac{1}{4} \cdot 1 + \frac{1}{4} \cdot 2 + \frac{1}{4} \cdot 3 + \frac{1}{4} \cdot 4 = \frac{1}{4} + \frac{2}{4} + \frac{3}{4} + \frac{4}{4} = \frac{10}{4} = 2.5$. This means that for any given number of spins, you would expect the sum of the results to equal 2.5 times the number of spins. For example, if the spinner were spun 10 times the expected value of the sum of the results would be $2.5 \cdot 10 = 25$.



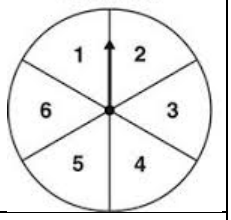
5 If you spin the spinner four times, what is the expected value of the sum of the four results?

A) 2.5 B) 10 C) 12.5 D) 20 E) 25



6 A different spinner has six outcomes each with a probability of 1/6, as shown below. What is the expected value of one spin of this spinner?

A) 21/36 B) 3 C) $3\frac{1}{6}$ D) $3\frac{1}{3}$ E) 3.5



7 When rolling a pair of standard six-sided dice once, what is the expected value of the sum of the two numbers showing on the dice?

A) 6 B) 121/18 C) 7 D) 131/18 E) $7\frac{1}{3}$

Refer to the following information for problems 8 – 10.

The following table shows the dates on which the last 10 world records in the men's and women's 1500-meter run were set. The times are given in minutes, seconds, and tenths of a second, up through 1980. Beginning in 1981, times are given in minutes, seconds, and hundredths of a second. The times in the top cell of the Women and Men columns are the current Women's and Men's world records in the 1500-meter run as of the time this scenario was written.

Women	Date	Men	Date
3:50.07	July 17, 2015	3:26.00	July 14, 1998
3:50.46	September 11, 1993	3:27.37	July 12, 1995
3:52.5	August 3, 1980	3:28.86	September 6, 1992
3:55.0	July 6, 1980	3:29.46	August 23, 1985
3:56.0	June 28, 1976	3:29.67	July 16, 1985
4:01.4	September 9, 1972	3:30.77	September 4, 1983
4:05.1	September 7, 1972	3:31.24	August 28, 1983
4:06.5	September 4, 1972	3:31.4	August 27, 1980
4:06.9	July 18, 1972	3:32.1 (.03)	July 15, 1980
4:09.6	August 15, 1971	3:32.1 (.09)	August 15, 1979

Source:https://en.wikipedia.org/wiki/1500_metres_world_record_progression

8 Based on the past 10 records shown in the table, during which month was a new men's world record in the 1500-meter run most often set?

A) July B) August C) September
D) equally often in July and August E) equally often in July, August, and September

9 In seconds, what is the average of the 9 reductions (reduction = how much time is shaved off by the new record-setter) in each of the 10 successive women's world records shown in the table?

A) 2.17 B) 2.21 C) 2.27 D) 2.31 E) 2.33

10 Imagine a race in which the women's 1500-meter world record holder from July 6, 1980, is racing against the women's 1500-meter world record holder from June 28, 1976. Assuming both runners run at their world record pace, how many meters would the slower runner still need to run in order to finish the race once the faster runner crosses the finish line?

A) 59/375 B) 118/375 C) 375/118 D) 375/59 E) Answer not given.

Math is Cool" Championships – 2019-2020

6th Grade – #date

Final Score:

KEY

Student Name _____

Proctor Name _____ 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 2 points for a correct letter response, 0 points for leaving it blank and -1 point for an incorrect response. When you are prompted to begin, tear off the colored sheet, pass out a copy of the test to each team member, and begin testing. ***Since this is a multiple choice test, ONLY a letter response should be listed as an answer on the answer sheet.***

DO NOT WRITE IN SHADED REGIONS

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

"Math is Cool" Championships – 2019-2020

6th Grade – #date

Final Score:

First Score
(out of 10)

SCHOOL NAME _____ **Team #** _____

Proctor Name _____ Room # _____

Team Contest – Score Sheet

TEAM TEST - 15 minutes – 30% of team score

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

DO NOT WRITE IN SHADED REGIONS

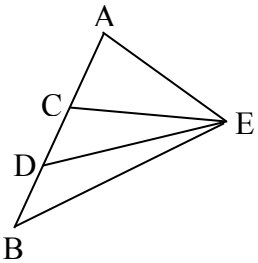
	Answer	1 or 0	1 or 0
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

“Math is Cool” Championships – 2019-2020

#sponsor

6th Grade – #date

Team Contest

1	A rope is 129 inches long. As a decimal to the nearest hundredth, what is the number of feet in the length of the rope?
2	Joe worked on memorizing his lines for the school musical for twice as many minutes on Saturday as he did on Sunday. If he memorized for 45 minutes on Sunday, how many total minutes did he memorize during the two days combined?
3	As a reduced fraction in lowest terms, what is the probability that a number selected at random from the following set is an even number? {1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17}
4	The four points A(-2, 2), B(4, 2), C(4, - 4), and D(-2, -4) are plotted on a coordinate plane. What is the number of square units in the area of ABCD?
5	The perimeter of a rectangle is 42 centimeters and the area is 98 cm^2. What is the number of centimeters in the length of the shortest side of the rectangle?
6	Kamala’s favorite number is a four-digit number between 2000 and 2300 inclusive. The digit in the hundred’s place is either a 0 or a 2. The digit in the tens place is either a 0 or a 2. The digit in the ones place is either a 0 or a 2. What is the sum of all numbers that could be Kamala’s favorite number?
7	The sum of the measures of the three angles in any triangle is 180˚. Let a, b, and c represent the whole number measures of the three angles in ΔABC, where c > b > a and a + b = 100˚. What is the greatest possible whole number value of c/a?
8	The surface area of the rectangular prism shown is 1550 cm^2. The ratio of length to width to height is 2:3:5. What is the number of cubic centimeters in the volume of the prism? 
9	A data set consists of 6 different whole numbers. The difference between the largest value and the smallest value is 21 and the median is 40. What is the largest possible mean of this data set?
10	What is the number of distinct pathways from point A to point B? No segments or parts of segments may be traveled more than once, but endpoints of segments labeled C, D, and E may be passed through more than once. 

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6th Grade – #date

Final Score:
KEY

SCHOOL NAME _____ **Team #** _____

Proctor Name _____ Room # _____

Team Contest – Score Sheet

TEAM TEST - 15 minutes – 30% of team score

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

DO NOT WRITE IN SHADED REGIONS

	Answer
1	10.75 [feet]
2	135 [min]
3	2/5
4	36 [units^2]
5	7 [cm]
6	16888
7	2
8	3750 [cm^3]
9	45
10	9 [pathways]

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____Team #_____

Proctor: _____ Room #_____

PRACTICE RELAY

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____Team #_____

Proctor: _____ Room #_____

PRACTICE RELAY

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____ Team #_____

Proctor: _____ Room #_____

RELAY #1

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____ Team #_____

Proctor: _____ Room #_____

RELAY #1

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____Team #_____

Proctor: _____ Room #_____

RELAY #2

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

“Math is Cool” Championships -- 2019-2020

6th Grade – #date

School:_____Team #_____

Proctor: _____ Room #_____

RELAY #2

Answer for question # 1	Answer for question # 2	Answer for question # 3	Answer for question # 4
1 or 0	1 or 0	1 or 0	2 or 0

Fill in your answer and pass back to the next person.

6th Grade	Practice Relay – Person 1
Question 1	What is 15% of 80?

6th Grade	Practice Relay – Person 1
Question 1	What is 15% of 80?

6th Grade	**Practice Relay – Person 2**
Question 1	What is 15% of 80?
Question 2	What is TNYWG squared?

6th Grade	**Practice Relay – Person 2**
Question 1	What is 15% of 80?
Question 2	What is TNYWG squared?

6th Grade	Practice Relay – Person 3
Question 2	What is TNYWG squared?
Question 3	What is the remainder when TNYWG is divided by 17?

6th Grade	Practice Relay – Person 3
Question 2	What is TNYWG squared?
Question 3	What is the remainder when TNYWG is divided by 17?

6th Grade	**Practice Relay – Person 4**
Question 3	What is the remainder when TNYWG is divided by 17?
Question 4	What is the cube root of TNYWG?

6th Grade	**Practice Relay – Person 4**
Question 3	What is the remainder when TNYWG is divided by 17?
Question 4	What is the cube root of TNYWG?

6th Grade	**Relay #1 – Person 1**
Question 1	How many positive whole number factors of 32 are multiples of 2?

6th Grade	**Relay #1 – Person 1**
Question 1	How many positive whole number factors of 32 are multiples of 2?

6th Grade	Relay #1 – Person 2
Question 1	How many positive whole number factors of 32 are multiples of 2?
Question 2	What is TNYWG cubed?

6th Grade	Relay #1 – Person 2
Question 1	How many positive whole number factors of 32 are multiples of 2?
Question 2	What is TNYWG cubed?

6th Grade	Relay #1 – Person 3
Question 2	What is TNYWG cubed?
Question 3	What is 20% of TNYWG?

6th Grade	Relay #1 – Person 3
Question 2	What is TNYWG cubed?
Question 3	What is 20% of TNYWG?

6th Grade	**Relay #1 – Person 4**
Question 3	What is 20% of TNYWG?
Question 4	If you reverse the digits of TNYWG, what is the largest prime factor of the resulting number?

6th Grade	**Relay #1 – Person 4**
Question 3	What is 20% of TNYWG?
Question 4	If you reverse the digits of TNYWG, what is the largest prime factor of the resulting number?

6th Grade	Relay #2 – Person 1
Question 1	As a decimal to the nearest tenth, what is fifty divided by twenty?

6th Grade	Relay #2 – Person 1
Question 1	As a decimal to the nearest tenth, what is fifty divided by twenty?

6th Grade	Relay #2 – Person 2
Question 1	As a decimal to the nearest tenth, what is fifty divided by twenty?
Question 2	What is TNYWG times four?

6th Grade	Relay #2 – Person 2
Question 1	As a decimal to the nearest tenth, what is fifty divided by twenty?
Question 2	What is TNYWG times four?

6th Grade	**Relay #2 – Person 3**
Question 2	What is TNYWG times four?
Question 3	What is the mean of the two-digit multiples of TNYWG?

6th Grade	**Relay #2 – Person 3**
Question 2	What is TNYWG times four?
Question 3	What is the mean of the two-digit multiples of TNYWG?

6th Grade	Relay #2 – Person 4
Question 3	What is the mean of the two-digit multiples of TNYWG?
Question 4	TNYWG equals A^2 plus B^2 and A does not equal B. A and B are positive integers. What is A plus B?

6th Grade	Relay #2 – Person 4
Question 3	What is the mean of the two-digit multiples of TNYWG?
Question 4	TNYWG equals A^2 plus B^2 and A does not equal B. A and B are positive integers. What is A plus B?

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6th Grade – #date

Robert Dirks’ Relay Contest – Questions & Key

RELAYS - 5 minutes per relay – 15% of team score

There is no talking during this event and you must always be facing forward. Person #1 will be given an answer sheet(s) and will need to fill out the top. The proctor will hand out a strip of paper to each person. These need to be 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. You may write on the strip of paper to come up with your answer. However, when person #1 figures out his/her problem, he/she will record ***just his/her final answer*** *on the answer sheet and pass only the answer sheet back to the person behind. This continues until person #4 puts an answer on the answer sheet and gives it to the proctor. A correct answer from person #1, #2 and #3 is worth 1 point each. A correct answer from person #4 is worth 2 points making each relay worth 5 points. You will see the expression* ***TNYWG*** [Proctor: write this on the board] *which means: “the number you will get”. This is where you put your teammate’s answer that they pass back to you, and then you should be able to solve your question. Once the relay begins, turn over your strip of paper and* ***make sure you have the right person number.*** *Remember, no talking and remain facing forward to avoid being disqualified!*

	Practice Relay	Answer
Person 1	What is 15% of 80?	12
Person 2	What is TNYWG squared?	144
Person 3	What is the remainder when TNYWG is divided by 17?	8
Person 4	What is the cube root of TNYWG?	2
	Relay #1	Answer
Person 1	How many positive whole number factors of 32 are multiples of 2?	5
Person 2	What is TNYWG cubed?	125
Person 3	What is 20% of TNYWG?	25
Person 4	If you reverse the digits of TNYWG, what is the largest prime factor of the resulting number?	13
	Relay #2	Answer
Person 1	As a decimal to the nearest tenth, what is fifty divided by twenty?	2.5
Person 2	What is TNYWG times four?	10
Person 3	What is the mean of the two-digit multiples of TNYWG?	50
Person 4	TNYWG equals A^2 plus B^2 and A does not equal B. A and B are positive integers. What is A plus B?	8

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6th Grade – #date

KEY

PRACTICE RELAY

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
12	**144**	**8**	**2**
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 1

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
5	**125**	**25**	**13**
1 or 0	1 or 0	1 or 0	2 or 0

RELAY # 2

Answer for person # 1	Answer for person # 2	Answer for person # 3	Answer for person # 4
2.5	**10**	**50**	**8**
1 or 0	1 or 0	1 or 0	2 or 0

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6th Grade

School: _____ Team #_____

Proctor: _____ Room #_____

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

Do not use tally marks.

“Math is Cool” Championships -- 2019-2020

6th Grade

School: _____ Team #_____

Proctor: _____ Room #_____

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

Do not use tally marks.

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #1 – SET 1

#	Problem	Answer
1	What is three hundred times twelve point five?	3750
2	In terms of π, what is the number of square centimeters in the area of a circle with a diameter of twelve centimeters?	36π [cm^2]
3	How many prime numbers are between thirty and fifty?	5 [prime numbers]
4	How many seconds are in two hours and nine minutes?	7740 [seconds]
5	As a reduced fraction in lowest terms, what is the slope of a line that passes through the points three comma negative two and negative nine comma four?	-1/2 or "-1 over 2" or "1 over -2"
6	As a decimal to the nearest hundredth, what is the number of square inches in the area of a rectangle where the length is three times the width and the length is thirteen point five inches?	60.75 [in^2]
7	Jenny randomly draws two marbles from a jar containing five blue marbles and thirteen red marbles. As a reduced fraction in lowest terms, what is the probability that both marbles are red?	26/51 or "26 out of 51" or "26 over 51"
8	What is the greatest prime number less than two hundred?	199
9	What is the sum of all the positive integer factors of twenty-four?	60
10	Your parents limit you to two-and-a-half hours of screen time per day. If you have already used forty-five minutes of screen time, what percentage of the total time is left?	70 [percent]

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #2 – SET 2

#	Problem	Answer
1	A drawer contains five red socks, fourteen blue socks, seven yellow socks, and fifty-seven green socks. How many socks must I take out of the drawer without looking to guarantee that I have a pair with the same color?	5 [socks]
2	A right triangle has one acute angle that measures thirty-eight degrees. What is the degree measure of the other acute angle?	52 [degrees]
3	What is twenty percent of ten percent of one hundred?	2
4	A right triangle has legs of length eight inches and six inches. How many inches are in the perimeter of the triangle?	24 [inches]
5	Loki shapeshifts thirteen times every six hours. In a week, how many times will he shapeshift?	364 [times]
6	At a hot dog stand there are sesame seed and plain buns, ketchup, mustard, and mayonnaise, and possible toppings include onions, sauerkraut, and relish. How many distinct hot dogs are available, assuming a hot dog contains one bun, one condiment, and one topping?	18 [hot dogs]
7	How many positive integer factors do forty-eight and sixty have in common?	6 [factors]
8	How many distinct ways can you arrange the letters in the word RIDE, spelled R – I – D – E?	24 [ways]
9	How many cups are in two gallons?	32 [cups]
10	What is thirty-three squared minus one?	1088

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #3 – SET 3

#	Problem	Answer
1	Find the average of the numbers from one to fifteen.	8
2	Juliana can mow four lawns in seven hours. How many lawns can she mow in thirty-five hours?	20 [lawns]
3	Yesterday, Jacob worked for twelve hours earning fourteen dollars per hour. In hours, how long would he have to work to make the same amount if he was earning twenty-one dollars per hour?	8 [hours]
4	How many threes would you need to multiply together to get a product greater than one thousand?	7 [threes]
5	Nick likes the first meme out of every five memes that he sees on Instagram. Zoe likes the first meme out of every seven she sees. If they look at a meme account with eight hundred posts, how many memes will they both like, assuming they both like the first one they see?	23 [memes]
6	When nine hundred and fifteen is added to X, the result is fifteen more than two times X. What is the value of X?	[x =] 900
7	What is the number of square inches in the area of a square that has its vertices at the midpoints of the sides of a larger square whose area is sixty-four square inches?	32 [in^2]
8	As a decimal to the nearest tenth, what is fifty-six percent of two thousand and twenty?	1131.2
9	How many diagonals can you draw in a regular nonagon?	27 [diagonals]
10	When on a trip to New Zealand, Zoe sees two penguins every twelve hours. At this rate, if Zoe stays in New Zealand for the whole month of June, how many penguins will she see?	120 [penguins]

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #4 – SET 4

#	Problem	Answer
1	What is the median of the following set of numbers: three, fifteen, eight, seven, four, twenty-two, and one?	7
2	If a recipe calls for one part flour for every three parts water, as a decimal to the nearest tenth, how many cups of flour should I use for six point six cups of water?	2.2 [cups]
3	What is eight divided by two-fifths?	20
4	What is the product of the number of diagonals in a pentagon, the number of sides in a trapezoid, and the number of yards in a quarter-mile?	8800
5	A rectangular prism has a volume of ninety cubic centimeters and the length of each of its edges is a whole number of centimeters. What is the number of centimeters in the smallest possible height of the prism if the bases of the prism are squares?	10 [cm]
6	What is the number of inches in the height of a trapezoid with bases of eight and fourteen inches and an area of one hundred and thirty-two square inches?	12 [inches]
7	How many distinct ways can I arrange the letters in the word “fooled”, spelled F – O – O – L – E – D?	360 [ways]
8	Two positive integers have a difference of four and a product of forty-five. What is their sum?	14
9	What is the product of eighteen, one-third, and two-thirds?	4
10	What is the greatest common factor of two hundred and seventy-six and eighty-four?	12

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #5 – SET 5

#	Problem	Answer
1	What is the positive difference between the number of days in a non-leap year and the number of seconds in an hour?	3235
2	If Lil Nas X drops three songs every month, how many songs will he drop in a year?	36 [songs]
3	A card is randomly from a standard fifty-two card deck. As a reduced fraction in lowest terms, what is the probability that it is black or that it is an eight?	7/13 or “7 over 13” or “7 out of 13”
4	Solve the following equation for X: seventeen X plus forty-five equals four X minus forty-six.	[x=] -7
5	A train leaves Chicago going to Detroit averaging ninety miles per hour. At the same time a second train leaves Detroit going to Chicago averaging sixty miles per hour. There are three hundred miles between Chicago and Detroit. What percent of the journey will the Chicago-bound train have completed when the two trains pass each other?	40 [%]
6	What is fifty-three squared minus forty-six squared?	693
7	Biff can arrange five books in sixty distinct ways. How many of the five books are identical?	2 [books]
8	Captain America is frozen in a cube of ice. Each side of the cube measures twenty feet, and the ice melts at an average rate of sixteen cubic feet per year. In how many centuries will the cube be completely melted?	5 [centuries]
9	The prices of Tesla cars are seventy-five thousand, thirty-five thousand, eighty-one thousand, and fifty thousand dollars. What is the positive difference between the highest and lowest of these prices?	[$] 46000
10	John’s number of followers triples every time he posts a vine. One morning, John has 7 followers. As a result of posting four vines that day, how many followers will he have?	567 [followers]

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND #6 – SET 6

#	Problem	Answer
1	How many faces do seven cubes have altogether?	42 [faces]
2	What is the fifth smallest prime number?	11
3	Two standard dice are rolled and the two numbers face-up are added. As a reduced fraction in lowest terms, what is the probability that the sum is eight?	5/36 or “5 out of 36” or “5 over 36”
4	What is the number of miles in sixty-three thousand three hundred and sixty feet?	12 [miles]
5	At Forever Thirty-Five, one shirt costs the same as three hats, and two hats cost the same as five pairs socks. How many shirts will cost the same as thirty pairs of socks?	4 [shirts]
6	Thirty dogs are living in an animal shelter. On Monday, sixty percent of the dogs are adopted out. On Tuesday, two-thirds of the remaining dogs are adopted out. On Wednesday, two dogs are adopted out. As a reduced fraction in lowest terms, what fraction of the original number of dogs are left in the shelter?	1/15 or “1 out of 15” or “1 over 15”
7	Apple sold five thousand iPhones in City A in twenty eighteen. If the number of iPhones they sell in City A goes down by ten percent every year, how many iPhones will they sell in City A in twenty twenty-one?	3645 [iPhones]
8	The probability of rain in Richland on any given day is sixty percent. The probability of Tom Holland being in Richland is zero point zero zero three percent. Assuming these two events are independent of each other, as a common fraction, what is the probability that it will rain on Sunday in Richland?	3/5 or “3 out of 5” or “3 over 5”
9	The first three terms of an arithmetic sequence are eight, fifteen, and twenty-two. What is the tenth term in the sequence?	71
10	Alana sings for five hours each weekday and for seven hours each day on weekends. How many hours will she sing in February of two thousand twenty-one?	156 [hours]

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6th Grade – #date

COLLEGE KNOWLEDGE BOWL ROUND – EXTRA

#	Problem	Answer
1	John Titus has already read fourteen chapters of a book with seventy-seven chapters in two days. Assuming he continues reading at the same rate, in how many more days will he finish the book?	9 [days]
2	At the start of Monday, the price of a box of chocolates was five dollars. The price was raised by twenty percent during the day, and then reduced by twenty-five percent at the start of Tuesday. In dollars and cents, what was the price of the chocolates after this reduction?	[$] 4.50 or “four fifty” or “four dollars and fifty cents”
3	What is the sum of the positive factors of eighteen?	39
4	What is the number of square inches in the area of a triangle whose base is ten inches and whose height is four times the length of the base?	200 [in^2]
5	The book “Larry Botter and the Philosopher’s Calculator” has ninety-seven thousand five hundred words. Each page in the book has an average of three hundred and twenty-five words. As a reduced fraction in lowest terms, what is the probability that a randomly chosen page number is a multiple of twenty-one?	7/150 or “7 out of 150” or “7 over 150”
6	A twenty-nine-foot ladder leans against a wall. If the ladder reaches a height of twenty-one feet up the wall, how many feet is the base of the ladder away from the base of the wall?	20 [feet]