Oklahoma School of Science and Mathematics

Thirteenth Annual Middle School Mathematics Contest
Round One, Spring 2015

Directions: Write the answer to each question in the box to the right of the question. Units are given in plural form even if the singular form is correct. Use scratch paper to do your work. Calculators are allowed, but not necessary.

Common fractions should be in simplest form ($\frac{a}{b}$, not mixed numbers)

Question	Answer
1. What is the value of $1+2+3+...+8+9+10+9+8+...+3+2+1$, where all of the integers from 1 through 10 and then back to 1 are added together?	1. 100
2. What is the value of $(2x+5)$ squared when $x=3$?	2. 121
3. Every solution to the equation $2y=6x$ has the same ratio, $x:y$. What is this ratio?	3. $1:3$
4. What value of x makes this conditional equation true? $2x-4=-12$	4. -4
5. Given that $\dfrac{x}{4}+\dfrac{y}{3}=5$, what is the value of $6x+8y$?	5. 120
6. If a square has an area given by $(2x-3)^4$, then what is its perimeter? a. $4(2x-3)^2$ b. $(2x-3)^2$ c. $4(2x-3)$ d. $(8x-12)^2$	6. ⓐ b. c. d.
7. $x^{10}+4x^9+4x^8=(?)(x+2)^2$ a. x^4 b. x^5 c. x^6 d. x^8 e. x^{10}	7. a. b. c. ⓓ e.
8. Simplify the mixed number expression. $5\frac{2}{3}-6\frac{4}{5}$.	8. $\dfrac{-17}{15}$
9. Solve the equation for x. $5\frac{1}{3}+x=2\frac{1}{2}$.	9. $\dfrac{-17}{6}$
10. Solve the linear inequality for c. $2(2-c)\geq\dfrac{-2+c}{3}$	10. $c\leq 2$
11. Four prime numbers a, b, c, and d form an increasing arithmetic sequence with $a>5$ and common difference 6. What is the ones digit of a?	11. 1
12. Is 317 prime or composite?	12. prime
13. What is the greatest common divisor of 162 and 252?	13. 18
14. If $\sqrt{O\times S\times S\times M}=O\times S\times S$, then what is the value of M? a. $O\times S\times S$ b. $S\sqrt{O}$ c. $O^2\times S^4$ d. 1 e. O^4	14. ⓐ b. c. d. e.
15. If each of three parallel lines has an integral slope then the product of their slopes cannot be a. -1 b. 0 c. 1 d. 2 e. 8	15. a. b. c. ⓓ e.
16. If three consecutive odd numbers have a sum of 2001, what is the value of the lowest number?	16. 665

17. A spoon collector has cases to display her spoons. In each case there are 16 spoons This table shows how the number of spoons, s, displayed depends on the number of cases c,. <table><tr><th>c</th><th>s</th></tr><tr><td>4</td><td>64</td></tr><tr><td>5</td><td>80</td></tr><tr><td>6</td><td>96</td></tr><tr><td>7</td><td>112</td></tr></table> How would you write this as an equation? a. $c = 16s$ b. $s = 16c$ c. $s = c + 60$ d. $s = 16c - 16$ e. $s = 16c + 16$	17. a. ⓑ c. d. e.
18. The probability in a particular school that there will be a pop quiz on any given school day is figured to be 10%. What is the probability that there will be a pop quiz two days in a row? Express your answer as a percentage.	18. 1%
19. A Quidditch team is made up of three chasers, two beaters, one keeper and one seeker. If there are to be eight Quidditch teams at a tournament, how many beaters are expected?	19. 16
20. Heather's car's gas tank is 1/3 full. After she buys 7 gallons of gas, it is 5/8 full. How many gallons can her car's gas tank hold?	20. 24 gallons
21. A standard deck of cards contains A, 2, 3, 4, 5, 6, 7, 8, 9, 10, J, Q, K in each of four suits (hearts, diamonds, clubs, and spades). If a card is drawn at random, what is the probability that the card will be a "face card" (J, Q, or K)? Express your answer as a reduced common fraction.	21. $\dfrac{3}{13}$
22. Colby drove 300 miles over 6 hours. At this rate, how far will he drive in 7.5 hours?	22. 375 miles
23. What percent of the first 50 positive integers contain digits that are multiples of 3?	23. 44%
24. If the exterior angle is the angle created between any side of a shape and a line extended from the next side, what is the exterior angle (in degrees) of a regular hexagon?	24. $60°$
25. The heights of the first five starters for the 8th grade basketball team are 5'2", 5'2", 5'3", 5'5", and 5'8". What is the mean height of these players in inches?	25. 64 inches
26. At a recent school dance there were a lot of black dresses. The ratio of black dresses to other colors was $7:13$. What percent of the dresses were black?	26. 35%
27. If a computer beeps every 16 seconds and clicks every 52 seconds, after how many seconds will it beep and click at the same time?	27. 208 seconds
28. At the end of a student exchange trip, Nick had 250 Euros left. If one euro is worth $1.20 in U.S. dollars, how many dollars are Nick's Euros worth?	28. $300

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