



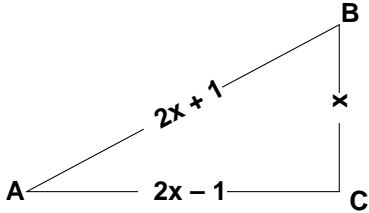
Oklahoma School of Science and Mathematics  
Tenth Annual Middle School Mathematics Contest  
Round One, Spring, 2012

Name: \_\_\_\_\_

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

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

1. If $x = 4$ , what is the value of $3x - 6$ ?	1. 6
2. Simplify $\frac{1}{2} + \frac{2}{3} - \frac{3}{4}$ . Write your answer as a common fraction in lowest terms.	2. $\frac{5}{12}$
3. Which number is closer to zero, $-\frac{4}{5}$ or $\frac{5}{4}$ ?	3. $-\frac{4}{5}$
4. Evaluate: $-1^{20} + (-1)^{21}$	4. -2
5. What is one half of the reciprocal of $\frac{4}{1,000}$ ?	5. 125
6. Simplify $\frac{1 - \frac{1}{3}}{3}$	6. $\frac{2}{9}$
7. Last week Ann paid \$10.80 for a DVD while the store was having a 25% off sale. How much did Ann save?	7. \$3.60
8. Solve for x: $2(x - 1) = 3(x + 2)$	8. $x = -8$
9. If $x - y = 2012$ what is the value of $y - x$ ?	9. -2012
10. When a third of a number is subtracted from half of the same number, the result is 60. What is the number?	10. 360
11. Tickets to the school play cost \$2.50 if purchased in advance and \$3.00 if purchased at the door. After the play, the school raised \$530.00 by selling 200 tickets. How many tickets were purchased at the door?	11. 60 tickets
12. What is the area of a triangle formed by the x-axis, the y-axis, and the line $3x + 8y = 12$ ?	12. 3 sq. units
13. Completely factor $2x^4 - 2$	13. $2(x+1)(x-1)(x^2+1)$
14. Bob takes a board that is 48 inches long and cuts it into two pieces. One piece is 16 inches longer than the other. What is the length of the shorter piece?	14. 16 inches
15. What is the exact value of the expressions $x^2 - 5$ if $x = 2 + \sqrt{5}$	15. $4 + 4\sqrt{5}$ or $4(1 + \sqrt{5})$

16. A small pool is 20 feet long, 12 feet wide, and 4 feet deep. There are 7.5 gallons of water in a cubic foot. At the rate of 5 gallons per minute, how long will it take to fill the pool (in hours)?	16. 24 hours
17. The sum of 4 consecutive integers is 2,174. What is the smallest of the four integers?	17. 542
18. What is the largest 3 digit integer in which the product of the digits is 8?	18. 811
19. There are 396 children, men, and women at a basketball game. If the ratio of children to men is 1:2 and the ratio of men to women is 2:3, how many men are at the game?	19. 132 men
20. In the figure below, find the value of $x$ that makes angle C a right angle. 	20. 8
21. A bag contains 10 marbles, each either red or blue. If two marbles are simultaneously removed from the bag, the chance that they are both blue is $\frac{2}{15}$ . How many red marbles are in the bag?	21. 6
22. The final digit of $3^6$ is 9. What is the final digit of $3^{2001}$ ?	22. 3
23. A ladder is leaning against a wall. Each step from one rung to the next you move 8 inches up and 6 inches closer to the building. The base of the ladder is 9 feet from the wall. How far up the wall does the ladder reach (in inches)?	23. 144 inches
24. "A journey of a thousand mile begins with a single step." If your step is two and $\frac{1}{2}$ feet, how many steps will a journey of a thousand miles take?	24. 2,112,000 steps
25. Ann says $\sqrt{x^2} = x$ . Bob disagrees. Who is right, Bob or Ann?	25. Bob
26. Three of these expressions are equivalent. Which one is not? <b>a)</b> $x - y + z$ <b>b)</b> $x + z - y$ <b>c)</b> $-y - (z - x)$ <b>d)</b> $x - (y - z)$	26. $c$ $-y - (z - x)$
27. In the sequence 2, 5, 8, 11, 14, . . . each number is three more than its successor. What is the 100 <sup>th</sup> number in the sequence?	27. 299
28. Simplify $\left(\frac{3^2 ab^2 c}{2^2 b^2 c^2}\right)^3 \left(\frac{2bc^2}{3a^2 b}\right)^2$	28. $\frac{81c}{16a}$ or $\frac{3^4 c}{2^4 a}$
29. A positive number that <u>cannot</u> be expressed as the sum of two or more consecutive positive integers is an <i>important</i> number to computer scientists. 1 is <i>important</i> , 2 is <i>important</i> , 3 is <b>not important</b> since $3=1+2$ , 4 is <i>important</i> , 5 is <b>not important</b> since $5=2+3$ , 6 is <b>not important</b> since $6=1+2+3$ , etc.  Is 128 an <i>important</i> number?	29. Yes