



**Oklahoma School of Science and Mathematics**  
**Fourth Annual Middle School Mathematics Contest**  
**Round One, Spring, 2006**

Directions: Write the answer to each question in the box to the right of the question. Use scratch paper provided to do your work. Calculators are allowed, but not necessary. **Common fractions should be in simplest form** ( $\frac{a}{b}$ , not mixed numbers).

1. There are 12 eggs in a carton, 8 cartons in a crate, and 9 crates in a container. How many eggs are in a container?	1. .	eggs
2. Write $200^6$ in scientific notation.	2.	
3. What is the value of $x + y$ if the sequence $2, 6, 10, \dots, x, y, 26$ is an arithmetic sequence?	3.	
4. What is the value of $3^{-1} + 2^{-2} + 1^{-3}$ as a common fraction?	4.	
5. A shape is translated so that the point $A(2, 5)$ moves to $A'(10, 15)$ . Under the same translation, to what point $B'$ does the point $B(-2, -4)$ move?	5. .	( , )
6. For how many positive integers, $x$ , is $250 \leq x^2 \leq 500$ ?	6.	
7. For how many positive integers, $x$ , is $250 < x < 500$ ?	7.	
8. The function $f(n) = n^2 + n + 17$ for integers $0 \leq n \leq 15$ generates prime numbers. What is the value of $f(10) - f(9)$ ?	8.	
9. Bubba Bigbucks used a \$100 bill to pay for two books that cost \$11.98 each, two CDs that cost \$12.94 each, and a shirt that cost \$21.50. If the tax rate is 8.25%, how much does Bubba receive in change from his \$100?	9. .	\$
10. What is the smallest 3-digit number that can be obtained from 4921508 by crossing out 4 digits?	10.	
11. Julia jogs at a rate of six miles per hour. What is her rate in feet per second? Express your answer as a decimal to the nearest tenth.	11. .	ft/sec
12. Which is larger, $2005^{2006}$ or $2006^{2005}$ ?	12.	
13. If $a + b = 24$ and $b + c = 35$ , what is the positive difference between $a$ and $c$ ?	13.	
14. How many two-digit numbers are divisible by both 2 and 7?	14.	
15. Given $\triangle ABC \sim \triangle BCD$ , if $AB = 12$ , $BC = 7$ , and $AC = 15$ , what is the length of $\overline{BD}$ ? Give your answer as a common fraction.	15.	
16. What is the value of $1 + 4\left(\frac{1}{2}\right) + 6\left(\frac{1}{2}\right)^2 + 4\left(\frac{1}{2}\right)^3 + 1\left(\frac{1}{2}\right)^4$ as a common fraction?	16.	
17. Solve for $x$ : $3^3 \cdot 9^3 \cdot 27^3 \cdot 81^3 = 9^x$ .	17.	
18. How many digits does $16^5 \times 5^{16}$ have when multiplied out?	18.	
19. On a number line, point M is the midpoint of $\overline{AB}$ . The coordinate of A and M are $-2$ and $7$ respectively. What is the coordinate of point B?	19.	
20. A rectangular wall is being covered with 4-inch by 4-inch square tiles. How many tiles are needed to completely cover a wall that is 5 feet by 7 feet?	20. .	tiles