

Kansas City Area Teachers of Mathematics
2011 KCATM Math Competition

ALGEBRA
GRADE 4

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.
- Time limit: **20 minutes**
- You **may use calculators** on this test.
- Use the π **key** on your calculator **or 3.14** as the approximation for pi.
- Mark your answer on the Scantron sheet by **FILLING in the oval**.
- You **may not use rulers, protractors, or other measurement devices** on this test.

- Which number is “five less than twice seven”?
A. 14 B. 9 C. 23 D. 19 E. None of the above
- Which number is “four more than half thirty-six”?
A. 22 B. 40 C. 18 D. 16 E. None of the above
- Which is the correct expression for “three less than a number”?
A. $3 - n$ B. $3 - 2n$ C. $n - 3$ D. $2n - 3$ E. None of the above
- Which sign would be **correct** when comparing the following numbers:
 $12.7 \underline{\hspace{1cm}} 12.70$
A. $<$ B. $>$ C. \leq D. \geq E. None of the above
- Which inequality is **correct**?
A. $5400 > 5401$ B. $49 > 48.9$ C. $12.5 < 12.55$
D. $\frac{1}{2} > \frac{3}{5}$ E. None of the above
- What is the next number in the pattern: 51, 44, 37, ___?
A. 29 B. 32 C. 31 D. 30 E. None of the above
- Which number , n, works in the equation: $5n + 1 = 26$?
A. $n = 1$ B. $n = 5$ C. $n = -1$ D. $n = 3$ E. None of the above
- Find the value for the expression: $12 - (9 - 4) + 2$
A. 9 B. 5 C. 3 D. 1 E. None of the above
- Use patterns of numbers to help you find out many circles are in **Figure 1**.

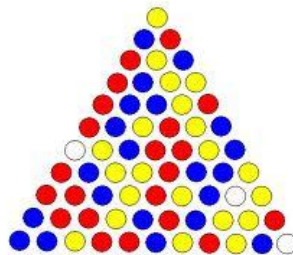







Figure 1

- A. 33 B. 59 C. 78 D. 66 E. None of the above
- Which one shows the **distributive property** for: $2(10 + 3)$?
A. $20 + 6$ B. $2 + 13$ C. $20 + 3$ D. $20 + 2$ E. None of the above

11. Which statement shows the **associative property of addition**?
- A. $6 + (4 + 5) = (6 + 4) + 5$ B. $(4 + 6) + 5 = 5 + (4 + 6)$
 C. $4(5 + 6) = 20 + 24$ D. $8 + 9 + 4 = 8 + 13$
 E. None of the above
12. Which statement shows the **commutative property of multiplication**?
- A. $7 \times 6 = 7 \times (4 + 2)$ B. $8 \times 9 = 9 \times 8$
 C. $4 + 5 = 5 + 4$ D. $3 \times (2 \times 7) = (3 \times 2) \times 7$
 E. None of the above
13. Grace’s mom is 38. Grace is 9. Which equation does **NOT** help you find how old Grace’s mom was when Grace was born?
- A. $9 + n = 38$ B. $38 - 9 = n$
 C. $38 - n = 9$ D. $n - 9 = 38$
 E. None of the above

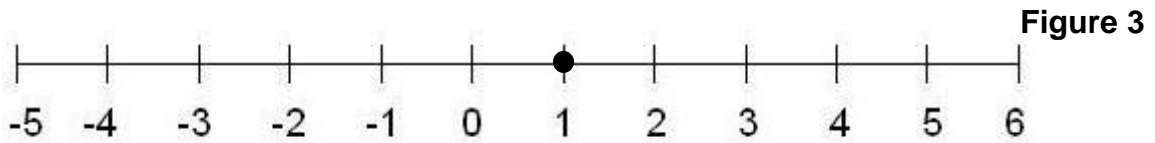
Figure 2

14. If every stick figure is a student in a class in Figure 2, how many more total students are in 3rd, 4th and 5th grades compared to the number of students in both 1st and 2nd grades?

CLASS	NUMBER OF STUDENT
FIRST	
SECOND	
THIRD	
FOURTH	
FIFTH	

- A. 16 B. 3 C. 1 D. 2 E. None of the above
15. Your family, including your aunts, uncles and cousins want to go to Worlds of Fun. There are 21 people in your family. How many five passenger cars would it take to get everyone to Worlds of Fun?
- A. 3 cars B. 4 cars C. 5 cars D. 6 cars E. None of the above
16. Evaluate the expression: $n + 2t$ when $n = 7$ and $t = 8$.
- A. 15 B. 17 C. 21 D. 23 E. None of the above
17. What is the exact amount of a 15% tip on an \$8 meal at a restaurant?
- A. \$1.20 B. \$12 C. \$1.50 D. \$0.15 E. None of the above

18. Use the number line in **Figure 3** to determine the value of: $1 - 4$. Read as “one subtract four”, “one minus four”, or “one take away four”)



- A. 3 B. 5 C. -4 D. -3 E. None of the above

19. Help the function machine in **Figure 4** determine the output when the number 36 is the input. See **Figure 4**.

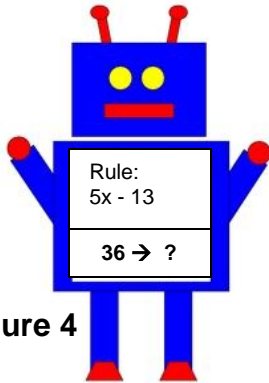


Figure 4

- A. 54 B. 180
 C. 167 D. 28
 E. None of the above

20. What would the value of “y” be in the following equation if $x = 7$?
Equation: $y = 0.4x - 2.1$

- A. $y = 0.7$ B. $y = 7$ C. $y = 2.8$ D. 4.9 E. None of the above

21. Solve the problem for the value of “N” that makes the equation true.
Equation: $8N + 1 = 57$

- A. 5 B. 6 C. 7 D. 8 E. None of the above

22. Three consecutive numbers have a sum of 180. What are the numbers?
 A. 57, 59, 61 B. 59, 60, 61
 C. 60, 60, 60 D. 58, 60, 62
 E. None of the above

23. Four times one half of a number is 48. What is the number?
 A. 24 B. 48 C. 16 D. 12 E. None of the above

24. Today is February 26, 2011. What date will it be in 1 week?
 A. March 4th B. March 5th C. March 6th
 D. March 7th E. None of the above

25. How many minutes are there in 1 day?
A. 24 minutes B. 60 minutes C. 1440 minutes
D. 8 minutes E. None of the above
26. You are measuring the turtle in **Figure 5** with a broken ruler. Which of the following math statements would **NOT** work for measuring the length of 6 inches?

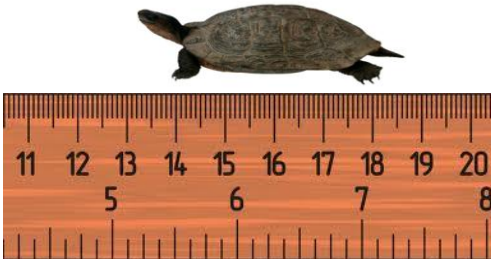


Figure 5

- A. 20 in. – 14 in. B. 18 in. – 12 in.
C. 16 in. – 10 in. D. 17 in. – 11 in.
E. None of the above

27. The sum of three times a number and four is which expression?
A. $3(x + 4)$ B. $3x - 4$ C. $x + 3(4)$ D. $3x + 4$ E. None of the above
28. If there are “R” number of rows of desks and “N” number of desks in each row, which expression shows how to find the number of desks in the room?
A. $R + N$ B. $R \div N$ C. $R \times N$ D. $R - N$ E. None of the above
29. How many total legs are there on 4 horses and 11 people?
A. 38 legs B. 30 legs C. 60 legs D. 54 legs E. None of the above
30. Which is **NOT** a way to express the number 60%?
A. $6/10$ B. $648/2$ C. 0.06 D. $60/100$ E. None of the above
31. You are 3 years older than your younger brother and 4 years younger than your older sister who is 17. In two years, how old will your younger brother be?
A. 15 B. 13 C. 11 D. 12 E. None of the above
32. Find the value of “A” if: $12 - A = 4$
A. 9 B. 8 C. 7 D. 6 E. None of the above
33. You buy 5 apples that cost \$0.90 each and 3 bottles of water for a total of \$8.25. How much did each bottle of water cost?
A. \$1.20 B. \$1.50 C. \$1.30 D. \$1.25 E. None of the above

34. Use the rectangle in **Figure 6** to write an expression for the perimeter.

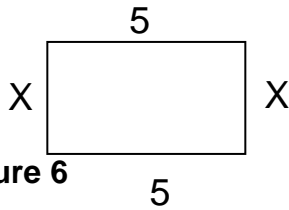


Figure 6

- A. $x + 20$
- B. $2x + 5$
- C. $x + x + 5 + 5$
- D. $5x$
- E. None of the above

35. The sum of Kody's age and Kelsey's ages is 27. Kelsey is 7 years older than Kody. How old is Kelsey?

- A. 14 yrs. old
- B. 11 yrs. old
- C. 9 yrs. old
- D. 13 yrs. old
- E. None of the above

36. In the table of values in **Figure 7**, what would the missing value be?

Input	3	15	45	60	100
Output	18	90	270	360	?

Figure 7

- A. 450
- B. 180
- C. 600
- D. 540
- E. None of the above

37. The sum of 2 numbers is 75 and the difference is 9. What are the two numbers?

- A. 43, 32
- B. 42, 33
- C. 44, 31
- D. 41, 34
- E. None of the above



38. You are scooping the snow from the snowfall in February 2011. You realize that each pass you make clearing your driveway takes 2 minutes. You count how many passes it takes to clear the drive. If you finish at 12:15, what time did you start scooping the snow?

- A. 10:15am
- B. 11:35am.
- C. 10:40am
- D. 10:35am
- E. None of the above

39. What is the missing number in the pattern: 128, 64, ____, 16, 4

- A. 2
- B. 60
- C. 32
- D. 48
- E. None of the above

40. What is the value of 2^3 ?

- A. 2
- B. 5
- C. 6
- D. 8
- E. None of the above