Kansas City Area Teachers of Mathematics
2012 KCATM Math Competition

ALGEBRA
GRADE 4

<u>INSTRUCTIONS</u>

- **Do not open this booklet** until instructed to do so.

- Time limit: **15 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.

Student Name _____ Student Number _____

School _____

1. Continue the pattern: 7, 10, 13, 16, ___, ___, ___
   A. 19, 20, 21   B. 18, 21, 24   C. 20, 23, 26
   D. 19, 22, 25   E. None of the above

2. What is the next number in the pattern: 2, 4, 8, 16, ___
   A. 20   B. 30   C. 32   D. 34   E. None of the above

3. What are the missing numbers in the pattern: 2310, 2320, __, __, 2350
   A. 2330, 2360   B. 2330, 2340   C. 2330, 2370
   D. 2340, 2360   E. None of the above

4. Which of the following number sets are all odd numbers?
   A. 22, 33, 44   B. 11, 13, 16   C. 87, 55, 39
   D. 72, 84, 96   E. None of the above

5. Which sign would be **correct** when comparing the following numbers:
                        3,546 ___ 3,465
   A. <   B. =   C. >   D. ≤   E. None of the above

6. Compare the numbers: three hundred fifteen ___ three hundred fifty-one
   A. <   B. =   C. >   D. ≥   E. None of the above

Use the number line below for problems 7, 8, and 9.
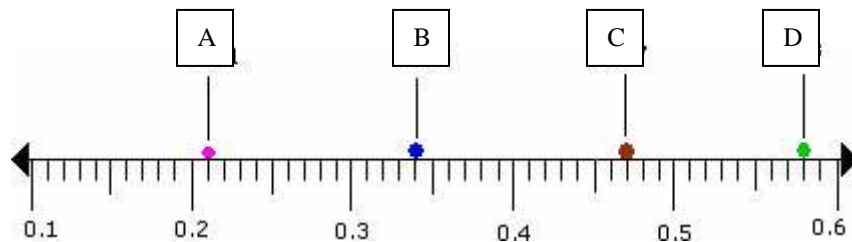
7. Compare the numbers and determine the correct sign: 0.5 ___ 0.6
   A. <   B. =   C. >   D. ≥   E. None of the above

8. What decimal value is located at point B?
   A. 0.33   B. 0.34   C. 0.31   D. 0.58   E. None of the above

9. Which two letters have the smallest difference in length between them?
   A. A & B   B. B & C   C. C & D   D. A & D   E. None of the above

10. Which sign would be **correct** when comparing the following numbers:

84.9 ____ 84.90

    A. <   B. =   C. >   D. ~   E. None of the above

11. Which inequality is **NOT correct**?

    A. 1/2 > 1/5   B. 38.1 > 38.0   C. 2.5 < 2.51
    D. 5/12 > 1/2   E. None of the above

12. Which number , n, works in the equation: $3n + 4 = 37$?

    A. n = 10   B. n = 11   C. n = 12   D. n = 33
    E. None of the above

13. Which shape below has an area has the same value as: (3 x 2) + 1?
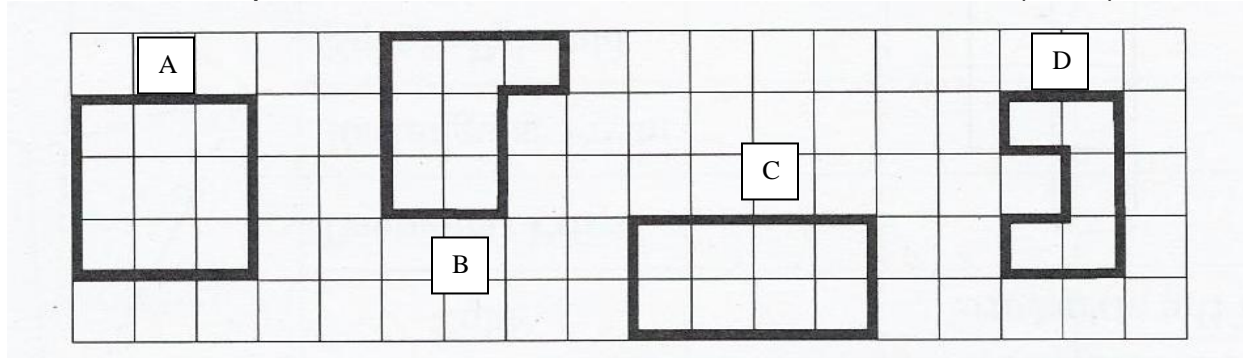

14. A composite number is a number that has factors other than "1". Which of the following numbers is a composite number?

    A. 51   B. 23   C. 79   D. 41   E. None of the above

15. Which number is "four more than half ten"?

    A. 14   B. 9   C. 24   D. 1   E. None of the above

16. Which number is "twelve more than twice eleven"?

    A. 32   B. 25   C. 10   D. 34   E. None of the above

17. Which is the correct expression for "five less than a number"?

    A. 5 - n   B. 2n - 5   C. n - 5   D. 5 – 2n   E. None of the above

18. Find the value for the expression: $8 + (13 – 4) + 2$

    A. 9   B. 19   C. 17   D. 20   E. None of the above

19. The expression " n^4 " means: n x n x n x n. What would the value of 2^4 be?

   A. 4   B. 6   C. 16   D. 8   E. None of the above

20. Which statement shows the **commutative property of addition**?
   A. 8 + (2 + 7) = (8 + 2) + 7   B. (8 + 2) + 7 = 8 + (2 + 7)
   C. 8 + (2 + 7) = 8 + (7 + 2)   D. 8(2 + 7) = (8 x 2) + (8 + 7)
   E. None of the above

21. Which statement shows the **associative property of multiplication**?
   A. 9 + (6 + 3) = (9 + 6) + 3   B. 9 x (6 x 3) = 9 x (3 x 6)
   C. 9 x 6 = 6 x 9   D. 3 x (2 x 7) = (3 x 2) x 7
   E. None of the above

22. Which one is the **distributive property** showing the product of 5 x 12 ?
   A. 5 + 10 x 5 + 2   B. 5 x 10 + 5 x 2   C. 12(5 + 1)
   D. 10 x 5 + 10 x 2   E. None of the above

23. Jaci's mom is 59. Jaci is 25. Which equation does **NOT** help you find the difference in their ages, n?

   A. 25 + n = 59   B. 59 – 25 = n
   C. 59 – n = 25   D. n – 25 = 59
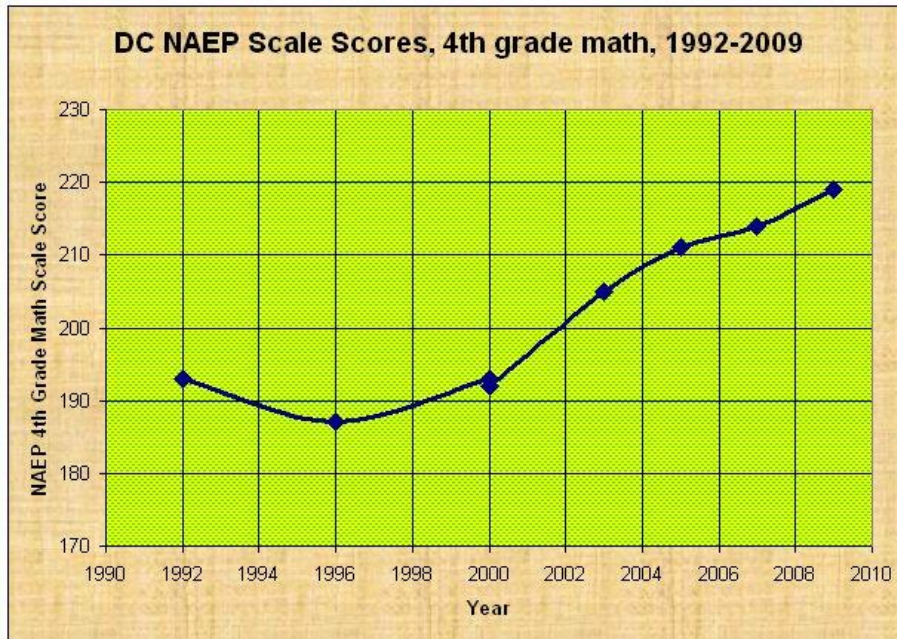   E. None of the above

Figure 2

24. Which equation does **NOT** give you the answer: n = 5 ?
   A. 3 x n = 15   B. 2 x n – 1 = 9   C. 6 x n + 3 = 30
   D. 4 x n – 7 = 13   E. None of the above

25. Which of the following does NOT represent the same value when comparing the shaded section to the section(s) not shaded and the fractional value?

   A.   B.   C.   D.
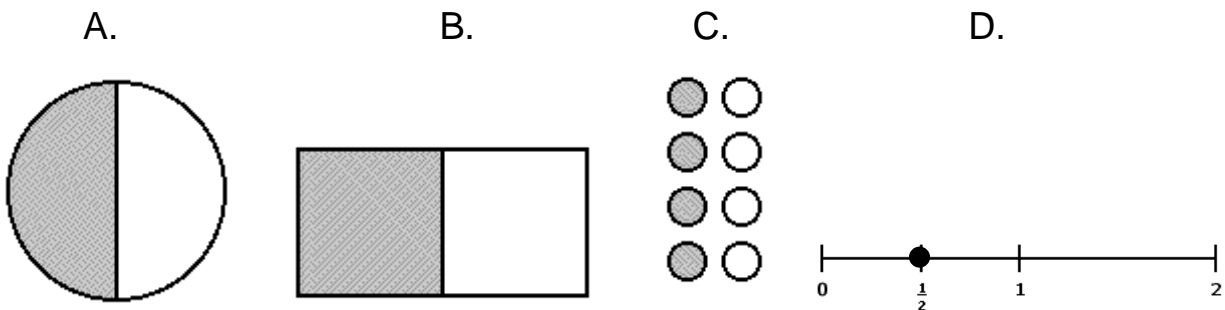
E. None of the above

Use the DC NAEP Scale Scores for 4th grade for problems 26-29.

DC NAEP Scale Scores, 4th grade math, 1992-2009

26. Which year did the NAEP scores have the lowest score?
    A. 1994   B. 1996   C. 2000   D. 1992   E. None of the above

27. Based on the graph, which conclusion is true?
    A. The scores for the students always improved from year to year.
    B. The scores for the students improved from 1994-2009.
    C. The scores for the students went down from 1992-1996.
    D. The scores for the students improved from 1994-2009.
    E.   None of the above

28. If the scores for year 2000 was 192 and the score for 2009 was 219, how
    much did the students improve?
    A. 27 pts.   B. 19 pts.   C. 17 pts.   D. 18 pts.   E. None of the above

29. A good estimate for the scores in 2003 is:
    A. 200   B. 205   C. 210   D. 300   E. None of the above

30.   Evaluate the expression: $10(n + 24) – 5$ when $n = 1$.
    A. 245   B. 250   C. 30   D. 200   E. None of the above

31. If $2x + 5 = 17$, $x = ?$
    A. 5   B. 6   C. 7   D. 8   E. None of the above

32. The restaurant bill for pizza was $25. What would a 20% tip be?
    A. $2.50   B. $4.00   C. $5.00   D. $6.00   E. None of the above

33. If the design pattern of squares continues, how many squares would be in the 5th diagram?
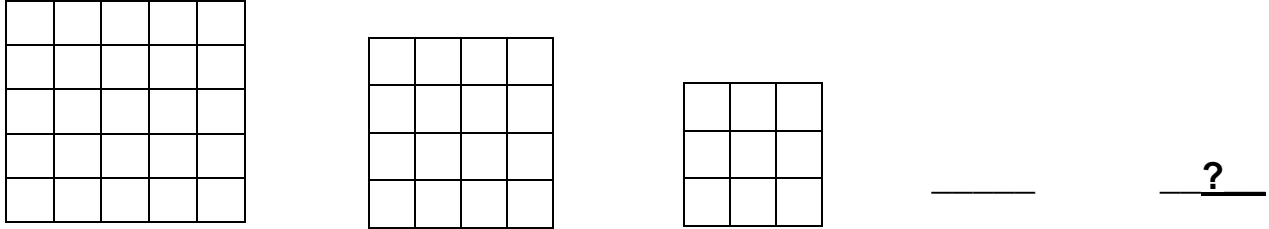
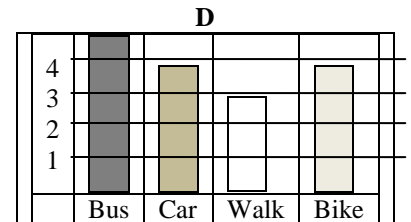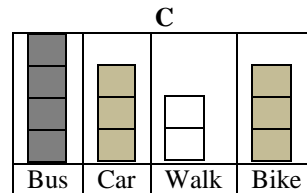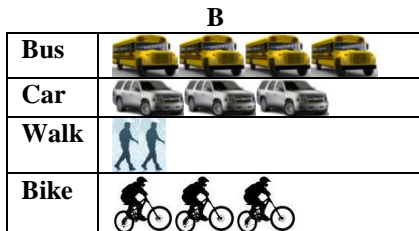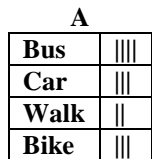   A. 6   B. 5   C. 4   D. 1   E. None of the above

34. Find the value: 20 + (8 + 4) ÷ 3
    A. 24   B. 10 2/3   C. 35   D. 29   E. None of the above

35. Evaluate the expression: **0.5n + 8t** when n = 6 and t = 3.

    A. 54   B. 27   C. 14   D. 41   E. None of the above

36. Given the following table showing different ways 4th grade students in one class get to school, which graph does **NOT** display the data correctly?

Bus	Car	Walk	Bike
Grace	Addison	Jamie	Armando
Juan	Avishek	N'dia	Keaton
Shyam	Jillian		Brecken
Morgan			

A

Bus	IIII
Car	III
Walk	II
Bike	III

B

| Bus	
Car	
Walk	
Bike	

C

D

E. None of the above

37. The cost for a regular season ticket to Worlds of Fun is $96.83. If the ticket was purchased by January 5th, the cost was $80.69 per ticket. If there are 4 members in your family, how much would your family have saved by buying the passes on January 1st?

   A. $16.14   B. $26.28   C. $64.56   D. $78.36   E. None of the above

38. Use the number line to determine the value of: 5 - 9. Read as *"five subtract nine", "five minus nine", or "five take away nine")*

Figure 3
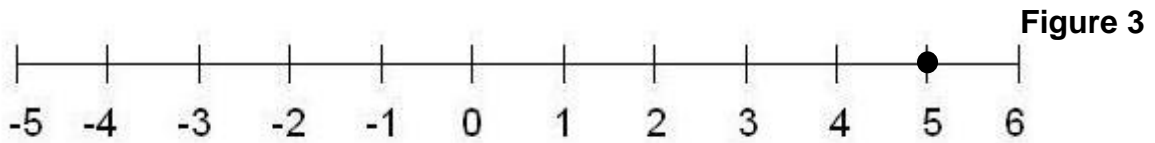
   A.   0   B. -5   C. -4   D. -3   E. None of the above

39. Help the function machine **determine the output** when the input is the number 17.

Rule:
2x - 25

17 → ?
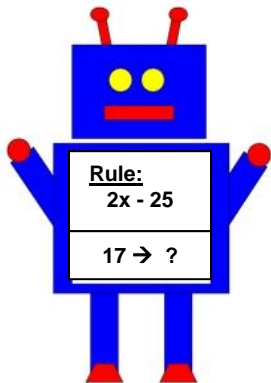
   A. 9   B. -8

   C. 21   D. 10

   E. None of the above

40. Three consecutive even numbers have a sum of 168. What are the numbers?
   A. 56, 58, 60   B. 54, 56, 57   C. 56, 56, 56
   D. 54, 56, 58   E. None of the above

Shade the correct answer!   Name_____

Example: A   ●   C   D   E

School _____

1.	A	B	C	D	E	21.	A	B	C	D	E
2.	A	B	C	D	E	22.	A	B	C	D	E
3.	A	B	C	D	E	23.	A	B	C	D	E
4.	A	B	C	D	E	24.	A	B	C	D	E
5.	A	B	C	D	E	25.	A	B	C	D	E
6.	A	B	C	D	E	26.	A	B	C	D	E
7.	A	B	C	D	E	27.	A	B	C	D	E
8.	A	B	C	D	E	28.	A	B	C	D	E
9.	A	B	C	D	E	29.	A	B	C	D	E
10.	A	B	C	D	E	30.	A	B	C	D	E
11.	A	B	C	D	E	31.	A	B	C	D	E
12.	A	B	C	D	E	32.	A	B	C	D	E
13.	A	B	C	D	E	33.	A	B	C	D	E
14.	A	B	C	D	E	34.	A	B	C	D	E
15.	A	B	C	D	E	35.	A	B	C	D	E
16.	A	B	C	D	E	36.	A	B	C	D	E
17.	A	B	C	D	E	37.	A	B	C	D	E
18.	A	B	C	D	E	38.	A	B	C	D	E
19.	A	B	C	D	E	39.	A	B	C	D	E
20.	A	B	C	D	E	40.	A	B	C	D	E

Shade the correct answer!   Name_____

Example: A ● C   D   E

School _____

ANSWER KEY

1.   A   B   C   ●   E   21.   A   B   C   ●   E
2.   A   B   ●   D   E   22.   A   ●   C   D   E
3.   A   ●   C   D   E   23.   A   B   C   ●   E
4.   A   B   ●   D   E   24.   A   B   ●   D   E
5.   A   B   ●   D   E   25.   A   B   C   D   ●
6.   ●   B   C   D   E   26.   A   ●   C   D   E
7.   ●   B   C   D   E   27.   A   B   ●   D   E
8.   A   ●   C   D   E   28.   ●   B   C   D   E
9.   A   B   ●   D   E   29.   A   ●   C   D   E
10. A   ●   C   D   E   30.   ●   B   C   D   E
11. A   B   C   ●   E   31.   A   ●   C   D   E
12. A   ●   C   D   E   32.   A   B   ●   D   E
13. A   ●   C   D   E   33.   A   B   C   ●   E
14. ●   B   C   D   E   34.   ●   B   C   D   E
15. A   ●   C   D   E   35.   A   ●   C   D   E
16. A   B   C   ●   E   36.   A   B   C   ●   E
17. A   B   ●   D   E   37.   A   B   ●   D   E
18. A   ●   C   D   E   38.   A   B   ●   D   E
19. A   B   ●   D   E   39.   ●   B   C   D   E
20. A   B   ●   D   E   40.   A   B   C   ●   E