Kansas City Area Teachers of Mathematics
2014 KCATM Math Competition

NUMBER SENSE
GRADE 6

NO CALCULATOR

INSTRUCTIONS

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

- Time limit: **20 minutes**

- You **may NOT use calculators** on this test.

- Some multiple-choice questions do not have the correct answer as one of the choices. On those questions, the response is e) not given
  i.e. $3 + 4 =$ a) 4   b) 5   c) 6   d) 8   e) none of the above

- Reduce all fractions.

- Simplify improper fractions to mixed numerals or whole numbers.
  i.e. $\frac{4}{2}$ should be written as 2

  $\frac{7}{3}$ should be written as $2\frac{1}{3}$

Student Name _____ Student Number _____

School _____

1. A chef uses 5 cups of flour and 2 cups of sugar in a recipe. Write a ratio that compares the number of cups of sugar to the number of cups of flour used.

    A. 3:2   B. 2:3   C. 2:5   D. 5:2   E. None of the above

2. Lexi uses 2 tablespoons of peanut butter and 3 tablespoons of jelly to make a sandwich. What does the ratio 5:2 mean in terms of the ingredients Lexi used for her sandwich?

    A. Ratio of peanut butter to jelly.
    B. Ratio of jelly to total ingredients.
    C. Ratio of peanut butter to total ingredients.
    D. Ratio of total ingredients to peanut butter.
    E. None of the above

3. Evaluate: $6^3 + 7 \cdot 4$
    A. 100   B. 757   C. 244   D. 892   E. None of the above

4. The length of a rectangular parking lot at the airport is 2/3 mile. If the area is 1/2 square mile, what is the width of the parking lot?

    A. 1/3 mile   B. 3/4 mile   C. 1 1/6 mile   D. 1 1/3 mile   E. None of the above

5. The table shows the number of packets of drink mix used to make different amounts of punch.

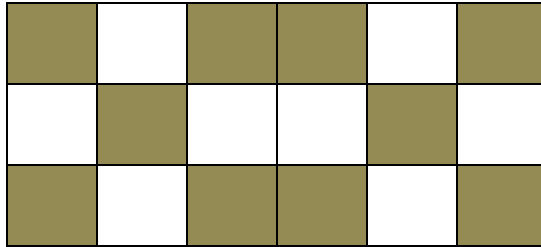| Number of Packets of Drink Mix	Total Quarts of Punch
8	2
16	4
24	?
36	9

    What is the total number of quarts of punch that can be made with 24 packets of drink mix?

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

6. Find:

    $$3\frac{5}{6} - \left(\frac{2}{3} - \frac{1}{2}\right)$$

    A. $3\frac{1}{6}$ B. $3\frac{2}{3}$ C. 4   D. $2\frac{5}{6}$ E. None of the above

7. Find: (0.15)(0.05)
     A. 0.0075   B. 0.0002   C. 0.075   D. 0.20   E. None of the above

8. Forty percent of what number is 60?
       A. 240   B. 24   C. 20   D. 67   E. None of the above

9. The coordinates of point A are (-5, 4). The coordinates of point B are (2, 4). Which expression represents the distance, in units, between points A and B?
       A. |2| - |-5| B. |-5| + |-4| C. |-5| + |2| D. |4| - |-5| E. None of the above

10. Find: $2^3 + \sqrt{25} \cdot 3 - 4^2 \div \sqrt{4}$
     A. 11.5   B. 31   C. 3.5   D. 15   E. None of the above

11. The first flock of birds contained 5283 birds. The second flock contained 5 times as many birds as the first. The third flock had twice as many birds as the second flock. How many **total birds** were there?
       A. 42,264   B. 84,528   C. 79,245   D. 81,458   E. None of the above

12. Find: 9876.5 – 643.99
       A. 343.66   B. 9232.51   C. 9232.69   D. 81,458   E. None of the above

13. The sale price of an item on sale for 40% off is $48. What was the **regular price**?
       A. $80   B. $120   C. $88   D. $192   E. None of the above

14. If 200 is increased by 130 percent, what is the **resulting number**?
       A. 360   B. 330   C. 460   D. 430   E. None of the above

15. What is the value of $2x^3 + 4x^2 - 3x^2 - 6x$ when $x = 3$?
       A. 261   B. 45   C. -12   D. -2   E. None of the above

16. The expression $3^3 \cdot 2^2$ is equivalent to which of the following numerical expressions?
       A. 6^6 B. 6^5 C. 27 • 4   D. 9 • 4   E. None of the above

17. Kalli has one 4 x 8 foot board. The length of the board is 8 feet. She plans to cut pieces that are 15 inches in length from the board. How many pieces can be cut from the board?
       A. 2   B. 4   C. 6   D. 8   E. None of the above

18. A grocery store sign indicates that bananas are 6 for $1.50, and a sign by the oranges indicates that they are 5 for $3.00. Find the total cost of buying 4 bananas and 4 oranges.
    A. $3.40   B. $1.70   C. $4.50   D. $9.00   E. None of the above

A new floor is being installed in the lobby of an office. The floor will be constructed of square tiles that are either gray or white and in the pattern that appears below. Use this information for questions 19 and 20.

19. What is the ratio of gray tiles to white tiles?
    A. 4:5   B. 5:4   C. 5:9   D. 9:5   E. None of the above

20. If the total cost of the white tiles is $12, what is the unit cost per white tile?
    A. $1.20   B. $72   C. $1.50   D. $15   E. None of the above

21. The level of the top of the water in the ocean is considered to be at an altitude of zero feet.
    - The ocean floor at a dive site is -25 feet.
    - A diver is located at -6 feet at the same site.
    - The captain of a boat is located at an altitude of 15 feet, directly above the diver.

    Which of the following is **true**?
    A. The distance from the captain to the diver is greater than the distance from the top of the water to the ocean floor.
    B. The distance from the captain to the top of the water is the same as the distance from the diver to the ocean floor.
    C. When the diver swims to -10 feet, the diver will be the same distance below the top of the water as the captain is above the top of the water.
    D. When the diver swims to -10 feet, the diver's distance to the ocean floor will be equal to the the distance the captain is above the top of the water.
    E. None of the above.

21. Four friends decide to go on diets. The table below shows their beginning weight and their current weights.

Who has lost the **greatest percentage** of his or her initial weight?

	Beginning Weight (lbs)	Current Weight (lbs)
Anna	200	175
Bill	275	250
Carl	180	160
Don	300	270

  A. Carl   B. Anna   C. Bill   D. Don   E. All same weight loss

23. Tracy filled up her 16-gallon gas tank for $51.20 at the Fuel Tank. Rachel filled up her 13-gallons for $44.20 at the Gas Can. Which statement most accurately compares the gas prices?
    A. Tracy got a better deal because 16 gallons is more than 13 gallons.
    B. Tracy got a better deal because the price per gallon at the Fuel Tank is less.
    C. Rachel got a better deal because the price per gallon at the Gas Can is less.
    D. Rachel got a better deal because she paid less money.
    E. None of the above.

24. A scale drawing for a project uses a scale of 1 inch = 4 feet. The dimensions of the rectangular bedroom on the scale drawing are 7.5 inches by 12 inches. What will be the **actual area** of the floor of the bedroom after the project is completed?

  A. 90 square feet   B. 156 square feet   C. 360 square feet
  D.   1440 square feet   E. None of the above

25. A recipe calls for ¾ cup of sugar for one batch of cookies. Joe as 3 ½ cups of sugar. Which of the following can be used to find the total number of batches of sugar cookies Joe can make?

  A. 3 ½ ÷ ¾   B. 3 ½ • ¾   C. 3 ½ + ¾   D. 3 ½ - ¾   E. None of the above

26. A local grocery store is advertising a special on charcoal. The advertised price is "3 bags for $11.49". What is the cost of 5 bags?
  A. $15.50   B. $18.40   C. $19.15   D. $22.75   E. None of the above

27. Find: $3\frac{1}{2} \cdot 6\frac{1}{3} \div 2\frac{1}{3} \cdot 1\frac{1}{3}$

A. $7\frac{1}{8}$ B. $9\frac{2}{3}$ C. $36\frac{1}{2}$ D. $12\frac{2}{3}$ E. None of the above

28. For 4 hours Steve traveled at 40 miles per hour. Then he increased his speed to 60 miles per hour and drove for another 3 hours. How far did he go in the 7 hours he traveled?
    A. 280 miles   B. 295 miles   C. 320 miles   D. 340 miles   E. None of the above

29. Which of the following is equivalent to: $7^{-6} \cdot 7^4$
    A. 7^{-24} B. 7^{-10} C. 7^2 D. 7^{10} E. None of the above

30. The weekly sales of a magazine increased from 500,000 to 600,000. By what percentage did the magazine sales increase?
    A. 7%   B. 20%   C. 83%   D. 120%   E. None of the above

31. Find the product of the greatest common factor and the least common multiple of 24 and 36.
    A. 1728   B. 216   C. 864   D. 423   E. None of the above

32. Forty-five is what percent of 72?
    A. 62.5%   B. 45%   C. 60.4%   D. 32.4%   E. None of the above

33. Find the value of:
$$0.4 + \frac{2(1.1 - 0.6)}{0.5}$$

A. 5.4   B. 3.6   C. 2.8   D. 2.4   E. None of the above

34. The original price of an item was $60. It was offered on sale with a 20% discount. Later, it was discounted an additional 25%. What is the final price?
    A. $33   B. $36   C. $45   D. $48   E. None of the above

35. A square table top has an area of 149 square inches. The length of a side of the table top will be between which two numbers of inches?

   A. 10 and 11   B. 11 and 12   C. 12 and 13   D. 13 and 14   E. None of the above

36. The table shows the total number of games played and the number of games won by 4 teams.

	Total Number of Games Played	Number of Wins
Basketball	18	15
Football	7	4
Golf	14	8
Softball	20	18

Which has the lowest loss to win ratio?

A. Basketball   B. Golf   C. Football   D. Softball   E. None of the above

37.   Find: $(\frac{7+7^2}{2^3} - 2) + \frac{12^2}{12^1}$

A. 17   B. 18.75   C. 21   D. 115   E. None of the above

38. What is the value of $2^0 + 2^{-1} + 2^{-2}$?
A.   -6   B. 2^{-3} C. 1 ½   D. 7   E. None of the above

39. Ariel devoted 2/5 of her study time to mathematics, 3/20 to Spanish, 1/3 to chemistry, and the remaining 42 minutes to English. How many minutes did she spend studying Spanish?

A. 9   B. 144   C. 24   D. 54   E. None of the above

40. Mike worked 4 3/4 hours on Monday, 2 5/8 hours on Tuesday, and 3 1/2 hours on Wednesday. What is the mean number of hours he worked?
A. 3 5/8   B. 10 7/8   C. 3 1/2   D. 2 7/8   E. None of the above

Shade the correct answer!

Example: A   ●   C   D   E

Name_____

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!
Example: A ● C D E

Name_____

School _____

ANSWER KEY

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