

Kansas City Area Teachers of Mathematics
2017 KCATM Math Competition

NUMBER SENSE
GRADES 7-8

NO CALCULATOR

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.
- Time limit: **20 minutes**
- You **may NOT use calculators**.
- 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.
- Letter **“E” is “None of the above”** , which is a correct answer for some of the problems.
- With circles, **exact answers** will be given in terms of π .

Student Name _____ Student Number _____

School _____

#1-4 Find the value of each expression when $x = -2$ and $y = 3$

1. $2x + y$ A. 7 B. -6 C. -1 D. 4 E. None of the above
2. x^3 A. -6 B. -8 C. 6 D. 8 E. None of the above
3. $x^2 - 4y$ A. -8 B. -16 C. 8 D. -10 E. None of the above
4. $(-1x^2y)^2$ A. 144 B. 81 C. -12 D. -144 E. None of the above

#5-17. Evaluate.

5. $7(5 - 2) \div 3 + 1$ A. 12 B. 8 C. 5.25 D. $17 \frac{1}{3}$ E. None of the above
6. $\frac{5-6(2)}{6(8)+1}$ A. 7 B. $\frac{1}{7}$ C. $-\frac{1}{7}$ D. -7 E. None of the above
7. $\frac{4^2-1(2)}{9 \div 3(3)-2}$ A. 1 B. 3 C. 5 D. 15 E. None of the above
8. $\frac{6!}{5!}$ equals A. 1 B. 6 C. 30 D. 11 E. None of the above
9. $47(100 - 1)$ A. 4653 B. 4695.3 C. 4699.53 D. 4700 E. None of the above
10. $\frac{5^6}{5^4}$ A. 10 B. $\frac{1}{25}$ C. $\frac{1}{10}$ D. 25 E. None of the above
11. $16^{1/2} =$ A. 256 B. 8 C. 32 D. 4 E. None of the above
12. $8^{2/3} =$ A. 2 B. 3 C. 4 D. 8 E. None of the above
13. $\frac{1}{4}$ of a $\frac{1}{4} =$ A. $\frac{1}{2}$ B. $\frac{1}{8}$ C. $\frac{1}{16}$ D. 1 E. None of the above
14. 125% of 10 is A. 12.5 B. 1,250 C. 125 D. 8.75 E. None of the above
15. $9 \times 9 + 9 \div 9 - 9$ A. 73 B. 1 C. 9 D. 89 E. None of the above
16. Expand the scientific notation: 3.47×10^{-4}
- A. 34,700 B. 0.0347 C. 0.000347 D. 347 E. None of the above
17. Evaluate and leave in scientific notation: $\frac{9.8 \times 10^1}{4.9 \times 10^3}$
- A. 2×10^{-2} B. 3×10^{-2} C. 2×10^4 D. 2×10^{-4} E. None of the above

18. Your parent's employer is raising funds for a homeless shelter. If each of 250 employees put \$25 into the fund, how much money would they raise?
- A. \$5000 B. \$6250 C. \$6500 D. \$7250 E. None of the above
19. A googol has how many zeroes?
- A. 10 B. 100 C. 1,000 D. 1,000,000 E. None of the above
20. A negative base to an even exponent is always ...
- A. positive B. negative C. an even number D. an odd number E. None of the above
21. Squaring a square root is...
- A. the number times itself
B. The number under the radical sign
C. A number twice the original number
D. A smaller number than the base
E. None of the above
22. Find the sum of the first 99 natural numbers: $1 + 2 + 3 + \dots + 97 + 98 + 99$
- A. 5,000 B. 9,900 C. 4,550 D. 4,950 E. None of the above
23. A 15° angle at the center of a circle is what fractional part of the entire circle?
- A. $1/2$ B. $1/4$ C. $1/6$ D. $1/24$ E. None of the above
24. How many seconds are in a day?
- A. 60 B. 3,600 C. 86,400 D. 1,440 E. None of the above
25. To the **nearest miles per hour**, what is the average rate of speed when you travel 320 miles in 5 hours?
- A. 67 mph B. 64 mph C. 70 mph D. 71 mph E. None of the above
26. How far can you drive in 3.5 hours traveling 75 miles per hour?
- A. 262.5 miles B. 245 miles C. 250.5 miles D. 275 miles E. None of the above
27. A number times its multiplicative inverse is what number?
- A. 0 B. 1 C. -1 D. the original number E. None of the above

28. $\sqrt{32} =$ A. $4\sqrt{32}$ B. $4\sqrt{2}$ C. $2\sqrt{2}$ D. $8\sqrt{2}$ E. None of the above
29. How factors are there in 128? A. 4 B. 6 C. 8 D. 10 E. None of the above
30. What is the next number in the sequence: 8, 27, 64, ___ ?
- A. 130 B. 125 C. 225 D. 256 E. None of the above
31. Change 0.125 into a reduced fraction.
- A. $1/4$ B. $1/5$ C. $1/6$ D. $1/8$ E. None of the above
32. What is the next consecutive odd number when you start with an odd number, N?
- A. $N + 2$ B. $N + 1$ C. N D. $2n$ E. None of the above
33. 1^{1345} is what number?
- A. 0 B. $1/1345$ C. 1 D. 1345 E. None of the above
34. Given the perimeter of 24, what is the shape that gives you the largest area with that same perimeter?
- A. Rectangle B. Square C. Octagon D. Circle E. None of the above
35. How many perfect squares are there less than 1000?
- A. 100 B. 62 C. 41 D. 32 E. None of the above
36. If the US population in 2017 is 326.5 million, what place is it rounded to?
- A. 1,000s B. 10,000s C. 100,000s D. 1,000,000 E. None of the above
37. Approximately 20% of the US population is between 0-14. If the 2017 population is 326.5 million, approximately how many people are 14 and under?
- A. 65,200,000 B. 6,520,000 C. 652,000 D. 65,200 E. None of the above
38. $(((((10)^{-1})^{-1})^{-1})^{-1})^{-1})^{-1} =$ A. 10,000 B. 0.10 C. 1 D. 10 E. None of the above
39. $\left(\frac{2}{3}\right)^{-2} =$ A. $\frac{4}{6}$ B. $\frac{6}{4}$ C. $\frac{9}{4}$ D. $-\frac{4}{9}$ E. None of the above
40. A 20% discount on a \$100 item has an additional 10% off. What is the final cost?
- A. \$70 B. \$72 C. \$75 D. \$77 E. None of the above