

Kansas City Area Teachers of Mathematics  
2011 KCATM Math Competition

**NUMBER SENSE  
GRADES 7-8**

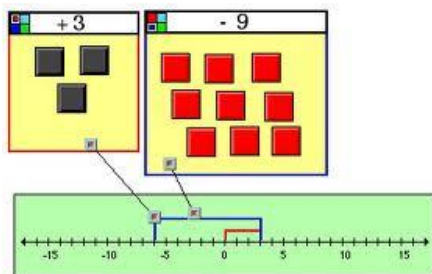
**NO CALCULATOR**

**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  $\pi$  .

- The fraction  $\frac{1}{8}$  is equivalent to which decimal value?  
 A. 0.125      B. 0.78      C. 0.875      D. 0.18      E. None of the above
- Thirty-five is what percent of 50?  
 A. 20%      B. 35%      C. 70%      D. 90%      E. None of the above
- Which fraction represents the decimal: 14.025 ?  
 A.  $14\frac{1}{4}$       B.  $14\frac{1}{40}$       C.  $14\frac{1}{400}$       D.  $14\frac{2}{5}$       E. None of the above

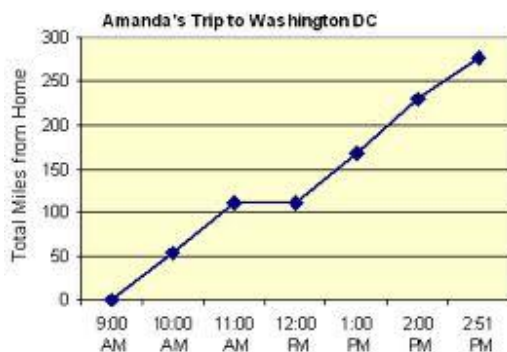
4. What is the problem that **Figure 1** is asking to be solved? What is the answer?



- The product:  $(3)(-9)$ . The answer is -6.
- The sum:  $+3 + -9$ . The answer is -6.
- The difference:  $+3 - (-9)$ . The answer is -6.
- The quotient:  $-9/+3$ . The answer is -6.

**Figure 1**

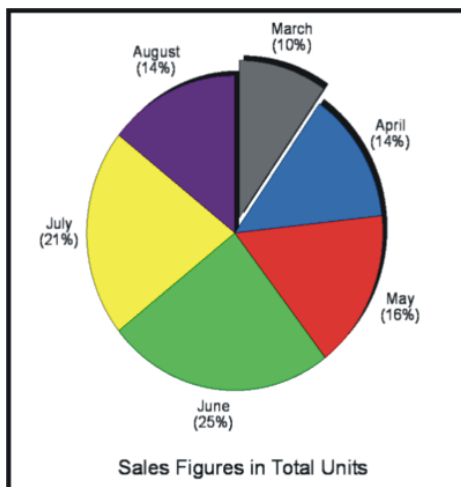
5. Which of the following conclusions is **NOT** true based on the data in the graph (**Figure 2**)?



**Figure 2**

- As time increases, Amanda's distance from home decreases.
- Amanda did not travel during 11:00 and 12:00.
- Amanda lives approximately 275 miles from Washington, D.C.
- It took Amanda 5 hr. 51 min. to make the trip to Washington D.C.
- None of the above

6. Use **Figure 3** to find the sales in March if the total sales for the year was \$6 million.



**Figure 3**

- \$6,000,000
- \$600,000
- \$60,000
- \$6,000
- None of the above

7. What would be the amount of a 15% tip on a restaurant bill of \$40?  
 A. \$3.00      B. \$4.00      C. \$5.00      D. \$6.00      E. None of the above
8. How much do you save when buying 4 pens in a package for \$5.20 instead of buying four of the same pens for \$1.60 each?  
 A. \$1.00      B. \$1.20      C. \$1.40      D. \$1.60      E. None of the above
9. Convert 0.0123 into a percent.  
 A. 0.123%      B. 1.23%      C. 12.3%      D. 123%      E. None of the above
10. Reduce 16% in lowest fraction form.  
 A.  $\frac{1}{16}$       B.  $\frac{3}{25}$       C.  $\frac{8}{50}$       D.  $\frac{4}{25}$       E. None of the above
11. Simplify  $\sqrt{12}$   
 A.  $4\sqrt{3}$       B.  $2\sqrt{3}$       C.  $3\sqrt{2}$       D.  $6\sqrt{2}$       E. None of the above
12. What is the value of:  $-|-49|$  ?  
 A. -7      B. 7      C. 49      D. -49      E. None of the above
13. What is the area of the triangle in **Figure 4**:

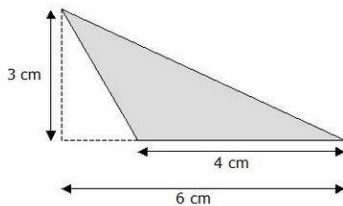


Figure 4

- A. 6 sq. cm      B. 18 sq. cm  
 C. 9 sq. cm      D. 12 sq. cm  
 E. None of the above

14. What is the area of circle in terms of  $\pi$  when the circumference is  $12\pi$  inches?  
*Formulas:  $C = \pi d$  and  $A = \pi r^2$*   
 A.  $6\pi \text{ in}^2$       B.  $12\pi \text{ in}^2$       C.  $36\pi \text{ in}^2$       D.  $144\pi \text{ in}^2$       E. None of the above
15. Three consecutive even numbers have a sum of 54, what is the smallest number?  
 A. 14      B. 16      C. 28      D. 20      E. None of the above
16. The ratio of angles of a triangle is 1: 2: 3. What are the degrees of the triangle?  
 A.  $30^\circ, 60^\circ, 90^\circ$       B.  $20^\circ, 40^\circ, 120^\circ$   
 C.  $40^\circ, 60^\circ, 80^\circ$       D.  $30^\circ, 40^\circ, 110^\circ$       E. None of the above
17. Evaluate the expression using the order of operations:  $8 + 3(7 - 10/5)$   
 A. 27      B. 17      C. 55      D. 23      E. None of the above
18. Jaci's older brother, Jaime, is 5 years older than she is. The sum of their ages is 53.  
 How old is Jaci?  
 A. 22      B. 23      C. 24      D. 25      E. None of the above

19. Which statement is NOT correct based on inferences made using the data of stock prices in the year 2001 for 5 companies in **Figure 5**?

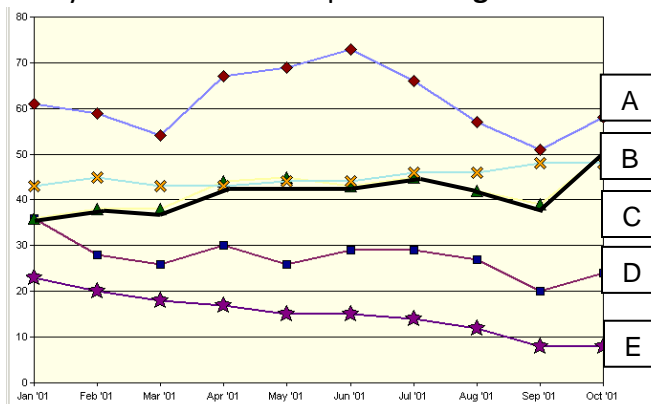


Figure 5

- A. A does not show a consistent trend.  
 B. B shows a very slight positive change.  
 C. D and E show a downward trend.  
 D. E is a strong negative correlation.  
 E. None of the above

20. Find the sum:  $5\frac{2}{3} + 4\frac{1}{5} + 3\frac{1}{2}$

- A.  $12\frac{2}{5}$       B.  $13\frac{11}{30}$       C.  $13\frac{2}{5}$       D.  $12\frac{23}{30}$       E. None of the above

21. Determine the difference between the two numbers:  $93.47 - 11.8$

- A. 81.67      B. 82.39      C. 81.39      D. 82.67      E. None of the above

22. Evaluate:  $2^3 - 3^2 + 5^0$

- A. 5      B. 0      C. -2      D. 2      E. None of the above

23. If  $f(x) = x^2 + 4x - 7$ , evaluate the function for  $f(-2)$

- A. -3      B. -19      C. 5      D. -11      E. None of the above

24. Evaluate:  $4^{-3}$

- A. -12      B.  $1/12$       C. -64      D.  $1/64$       E. None of the above

25. What is the value of  $(16)^{1/2}$ ?

- A. 4      B. 8      C.  $1/4$       D.  $1/8$       E. None of the above

26. What is the GCF of 12, 6, and 18?

- A. 3      B. 2      C. 9      D. 12      E. None of the above

27. What is the LCM of 8, 10, and 15?

- A. 60      B. 90      C. 120      D. 400      E. None of the above

28. Find the sum of the digits in the thousands place and the thousandths place in 1,234.56789

- A. 8      B. 9      C. 10      D. 11      E. None of the above

29.-31. Use the following sets to best describe the given set.

- I. {Real #}      II. {Integers}      III. {Whole #}      IV. {Natural #}

29. Which set(s) is the set of {...-4, -3, -2, -1} a subset?

- A. I only      B. II only      C. I and II only      D. I, II, and III      E. None of the above

30. {0, 3, 6, 9, ...} is a member of which set(s) of numbers?

- A. I and II only      B. II and III only      C. I, II, and III      D. I, II, III, and IV      E. None of the above

31. {... -2 ½, -2, -1 ½, -1, -½, 0, ½, 1, 1 ½, 2, 2 ½, ...} is a member of which set(s) of numbers?

- A. I only      B. II only      C. I and II only      D. I, II, and III      E. None of the above

32. You are saving for a car. You found an older model Mustang for \$2,300. You calculate that you have saved 40% of the cost of the car. How much will you have to borrow if your family is able to help you purchase this car?

- A. \$920      B. \$1380      C. \$690      D. \$1610      E. None of the above

33. Multiply:  $\left(5\frac{3}{7}\right) \times \left(\frac{1}{2}\right)$

- A. 5 3/14      B. 2 2/7      C. 2 5/7      D. 2 5/14      E. None of the above

34. Divide:  $\left(6\frac{2}{3}\right) \div \left(2\frac{1}{2}\right)$

- A. 3 1/3      B. 2 2/3      C. 3 2/3      D. 2 1/6      E. None of the above

35. Which value(s) make this equation true:  $|x + 2| = 8$

- A. 6      B. 6 and -10      C. 6 and -6      D. 6 and -4      E. None of the above

36. Determine the value of the expression:  $(2x^2 - x)/5$  when  $x = -5$ .

- A. 5      B. -5      C. 11      D. -11      E. None of the above

37. On a map,  $\frac{1}{2}'' = 25$  miles. How many miles would  $3\frac{1}{2}$  inches be?

- A. 100 mi.      B. 125 mi.      C. 150 mi.      D. 175 mi.      E. None of the above

38. Give an approximation of  $\sqrt{150}$

- A. It is between 8 and 9.      B. It is between 9 and 10.  
C. It is between 10 and 11.      D. It is between 11 and 12.      E. None of the above

39. What is the value of  $7.8 \times 10^{-4}$

- A. 78000      B. 0.00078      C. 0.0078      D. 7800      E. None of the above

40. Write the exponential equation:  $5^2 = 25$  as a logarithm.

- A.  $\log_{25} 5 = x$       B.  $\log_2 5 = 25$       C.  $\log_5 2 = 25$       D.  $\log_5 25 = 2$       E. None of the above