

Kansas City Area Teachers of Mathematics  
2015 KCATM Math Competition

**NUMBER SENSE  
GRADE 7**

**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  $\pi$  .

Student Name \_\_\_\_\_ Student Number \_\_\_\_\_

School \_\_\_\_\_

1. You are cutting  $3\frac{3}{4}$  yards of fabric into  $\frac{1}{8}$  yard strips for a craft project. How many  $\frac{1}{8}$  yard strips you would have?  
A. 24      B. 27      C. 28      D. 30      E. None of the above
2. To the **nearest mph**, what is the average rate of speed when you travel 500 miles in 8 hrs.?  
A. 61 mph    B. 62 mph    C. 63 mph    D. 64 mph    E. None of the above
3. Your wall is 12 feet wide and 8 feet tall. You want to position a picture in the middle of the wall. The picture is 36 inches wide and 30 inches tall. **How far off the floor would the picture hang?**  
A. 33 in.      B. 34 in.      C. 35 in.      D. 36 in.      E. None of the above
4. You want the government to raise the minimum wage so when you get a summer job you can get paid more. Which of these represents earning a minimum wage of at least \$10 per hour?  
A.  $w < 10$     B.  $w \leq 10$     C.  $w > 10$     D.  $w \geq 10$     E. None of the above
5. If two out of three people exercise, how many people would exercise out of 450?  
A. 280      B. 300      C. 320      D. 340      E. None of the above
6. There is a sale at Hollister's. The sign in the window says an extra 10% off the sales price. You find a pair of summer shorts on sale for \$18. What will the shorts cost after the sale?  
A. \$16.00    B. \$16.20    C. \$16.80    D. \$16.90    E. None of the above
7. What is the solution to the following?  $\frac{5}{6} - \frac{2}{3} \left( 6 - \frac{1}{2} \right) + \frac{3}{4}$   
A.  $-\frac{25}{12}$       B.  $-\frac{17}{12}$       C.  $\frac{20}{12}$       D.  $\frac{43}{12}$       E. None of the above
8. At a discount furniture store, Chris offered a salesperson \$600 for a couch and a chair. The offer includes the 8% sales tax. If the salesperson accepts the offer, what would be the price of the furniture, to the nearest dollar, before tax?  
A. \$552      B. \$556      C. \$592      D. \$648      E. None of the above

9. When John bought his new computer, he purchased an online computer help service. The help service has a yearly fee of \$25.50 and a \$10.50 charge for each help session a person uses. If John can only spend \$170 for the computer help this year, what is the maximum number of help sessions he can use this year?

- A. 12      B. 13      C. 14      D. 15      E. None of the above

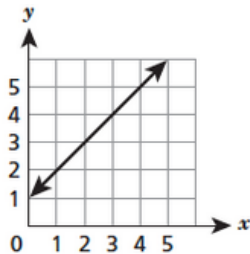
10. You price packages of treat bags. You figured that 18 bags cost \$27. You decided to purchase only 15 bags. How much would the 15 bags cost?

- A. \$21.00      B. \$23.00      C. \$24.50      D. \$22.50      E. None of the above

11. Anton is making a strawberry smoothie. The number of strawberries is proportional to the amount of milk, in cups. He uses 4 cups of milk for every 14 strawberries. Which equation represents the relationship between the number of strawberries,  $s$ , and the number of cups of milk,  $m$ , he uses?

- A.  $s = \frac{1}{10}m$       B.  $s = \frac{7}{2}m$       C.  $s = \frac{2}{5}m$       D.  $s = \frac{9}{2}m$       E. None of the above

12. What is the rate of change shown in the graph?



- A. 1  
B.  $\frac{1}{2}$   
C. 2  
D. -1  
E. None of the above

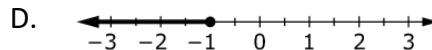
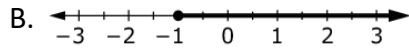
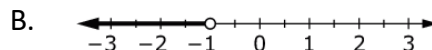
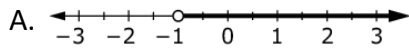
13. What is the value of:  $\frac{2}{5} + \left(3\frac{7}{10}\right) - (-5)$

- A.  $-\frac{9}{10}$       B.  $9\frac{1}{10}$       C.  $8\frac{9}{15}$       D.  $1\frac{7}{10}$       E. None of the above

14. A construction contractor purchases trim boards for crown molding at \$0.70 a foot, how much would it cost for 12 yards of trim board?

- A. \$18      B. \$22.50      C. \$25.20      D. \$8.40      E. None of the above

15. What is the solution to the inequality:  $3x + 5 < 2$



E. None of the above

16. What is the value of  $3.5(5 + 17)$

A. 77

B. 34.5

C. 25.5

D. 66.5

E. None of the above

17. Which procedure shows how to find an **increase of 20%** on the original cost of \$30?

A. Multiply \$30 by 0.20

B. Divide \$30 by 0.20

C. Multiply \$30 by 1.20

D. Divide \$30 by 1.20

E. None of the above

18. Which expression is the same as  $-80(n - 7)$ ?

A.  $-80n - 630$

B.  $80n + 560$

C.  $-80n + 630$

D.  $-80n - 560$

E. None of the above

19. If a gallon of paint says it will cover 400 sq. ft. If you used 2 gallons of paint to paint the base coat of a wall for painting a mural, which of the following dimensions could you have painted with your 2 gallons of paint?

A. 30 ft. by 40 ft.

B. 40 ft. by 40 ft.

C. 35 ft. by 30 ft.

D. 25 ft. by 25 ft.

E. None of the above

20. Which number would you have to divide  $1/2$  by to give you a value of less than  $1/3$ ?

A.  $\frac{2}{3}$

B.  $\frac{3}{2}$

C.  $\frac{1}{3}$

D.  $\frac{1}{2}$

E. None of the above

21. What is the constant of proportionality represented by the following points  $(x, y)$ .  
 $(4, 48), (5, 60), (6, 72), (8, 96)$

A. 10

B. 11

C. 12

D. 13

E. None of the above

22. You are going to double the brownie recipe that calls for  $2/3$  cup oil. How much oil will you add to the brownie mix?

A.  $2/3$  cup

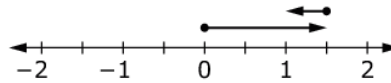
B. 1 cup

C.  $1\frac{1}{2}$  cup

D.  $1\frac{1}{3}$  cup

E. None of the above

23. Which problem is represented by the graph?



- A.  $1\frac{1}{2} + \frac{1}{2}$       B.  $1\frac{1}{2} - \frac{1}{2}$       C.  $\frac{1}{2} - 1\frac{1}{2}$       D.  $1\frac{1}{2} \left(\frac{1}{2}\right)$       E. None of the above

24. What is the next number in the sequence if the pattern continues? 4, -8, 16, -32, \_\_\_\_

- A. 16      B. 48      C. -64      D. 64      E. None of the above

Use the table to of values for problems #25 through 28.

| Foreign Language | Number of Students |
|------------------|--------------------|
| French           | 75                 |
| Spanish          | 225                |
| Latin            | 25                 |
| Japanese         | 25                 |
| German           | 50                 |

25. What percent of the students in the data took German?

- A. 12.5%      B. 14.3%      C. 16.7%      D. 50%      E. None of the above

26. What fraction of the students in the data took Spanish or French?

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

27. Which statement is NOT true based on the data?

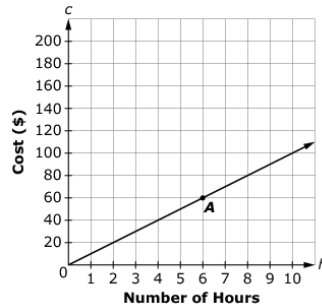
- A. Twice as many students took German compared to Latin.  
 B. Fifty more students took Spanish than the combined students in the other languages.  
 C. Half as many students took Japanese compared to the number of students taking German.  
 D. One-third as many students took Latin compared to French.  
 E. All of the statements are correct.

28. The band is planning on a trip to France next year sparking an interest in French. If the number of students doubles next year, what is the percent of increase?

- A. 50%      B. 75%      C. 100%      D. 200%      E. None of the above

Use the graph for problems #29-31. The graph shows the proportional relationship between the cost of renting a bicycle built for two (tandem bike) in a mountain bike shop.

**Cost of Renting a Tandem Bicycle**



29. What is the rate per hour for renting the bike?  
 A. \$6      B. \$8      C. \$9      D. \$10      E. None of the above
30. What is the meaning of the value of Pt. A?  
 A. Renting a tandem bike for 60 hours will cost \$6.  
 B. Renting a tandem bike for 6 hours will cost \$60.  
 C. Riding a tandem bike for 6 hours means we will be 60 miles away from the bike shop.  
 D. Climbing a hill for 6 hours will mean we are 60 miles uphill.  
 E. None of the above
31. What would the cost be for renting the bike for 12 hours?  
 A. \$100      B. \$110      C. \$120      D. \$130      E. None of the above
- 
32. If the entry to a carnival is \$7 and the cost of a ride is \$0.75, how many rides did you ride on if you spent \$16 at the carnival?  
 A. 12 rides      B. 11 rides      C. 13 rides      D. 10 rides      E. None of the above
33. For every  $\frac{1}{4}$  cup of blueberries, Cecilia uses  $\frac{1}{2}$  cup of water. How much water will she need if she uses  $1\frac{1}{2}$  cups of blueberries?  
 A.  $1\frac{3}{4}$  cups      B.  $2\frac{1}{2}$  cups      C.  $2\frac{3}{4}$  cups      D. 3 cups      E. None of the above
34. What is the **GCF** of: 15, 12, and 18?  
 A. 12      B. 3      C. 6      D. 9      E. None of the above
35. Simplify using the order of operations:  $-3(4 - 8)/2 + 12 \times 3$   
 A. 42      B. 54      C. 6      D. 26      E. None of the above

36. You have \$10 to spend in the store on school supplies. Use the table of values to determine which of the combinations of items you can buy with your money.

| Item    | Unit Price          |
|---------|---------------------|
| Pens    | \$0.90              |
| Paper   | \$1.35 (100 sheets) |
| Binder  | \$2.45              |
| Pencils | \$1.05 per package  |

A. 5 pens and 3 binders  
B. 2 binders and 300 sheets of paper  
C. 3 packages of pencils and 3 binders  
D. 3 pens, 200 sheets of paper, and 2 binders  
E. None of the above

37. What is the **sum** of:  $\frac{3}{4} + 2\frac{4}{5} - \frac{7}{10}$  ?

- A.  $2\frac{17}{20}$       B.  $3\frac{7}{10}$       C.  $1\frac{7}{20}$       D.  $2\frac{7}{20}$       E. None of the above

38. Convert pounds to grams: 2.5 pounds = \_\_\_\_\_ grams (1 pound  $\approx$  454 grams)

- A. 908 grams      B. 227 grams      C. 1362 grams      D. 1135 grams      E. None of the above

39. What is the value of  $\left(2\frac{1}{2}\right)\left(\frac{2}{5}\right)\left(\frac{5}{12}\right)$  ?

- A.  $\frac{5}{12}$       B.  $2\frac{2}{5}$       C.  $\frac{7}{12}$       D.  $5\frac{1}{12}$       E. None of the above

40. One-half of one-half of one-half of 2048 is:

- A. 128      B. 256      C. 512      D. 1024      E. None of the above

**Shade the correct answer!**Example: A  C D E

Name \_\_\_\_\_

School \_\_\_\_\_

1. A B C D E

2. A B C D E

3. A B C D E

4. A B C D E

5. A B C D E

6. A B C D E

7. A B C D E

8. A B C D E

9. A B C D E

10. A B C D E

11. A B C D E

12. A B C D E

13. A B C D E

14. A B C D E

15. A B C D E

16. A B C D E

17. A B C D E

18. A B C D E

19. A B C D E

20. A B C D E

21. A B C D E

22. A B C D E

23. A B C D E

24. A B C D E

25. A B C D E

26. A B C D E

27. A B C D E

28. A B C D E

29. A B C D E

30. A B C D E

31. A B C D E

32. A B C D E

33. A B C D E

34. A B C D E

35. A B C D E

36. A B C D E

37. A B C D E

38. A B C D E

39. A B C D E

40. A B C D E



Shade the correct answer!

Example: A  C D E

Name \_\_\_\_\_

School \_\_\_\_\_

**ANSWER KEY – JH 4.5.15**

1. A B C  E

2. A B  D E

3.  B C D E

4. A B C  E

5. A  C D E

6. A  C D E

7.  B C D E

8. A  C D E

9. A  C D E

10. A B C  E

11. A  C D E

12.  B C D E

13. A  C D E

14. A B  D E

15. A  C D E

16.  B C D E

17. A B  D E

18. A B C D  E

19. A B C  E

20.  B C D E

21. A B  D E

22. A B C  E

23. A  C D E

24. A B C  E

25.  B C D E

26. A B  D E

27. A B C D  E

28. A B  D E

29. A B C  E

30. A  C D E

31. A B  D E

32.  B C D E

33. A B C  E

34. A  C D E

35.  B C D E

36. A  C D E

37.  B C D E

38. A B C  E

39.  B C D E

40. A  C D E