

Kansas City Area Teachers of Mathematics
2016 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 π .

Student Name _____ Student Number _____

School _____

- You are dividing a journey of $7\frac{1}{2}$ km into into $\frac{1}{4}$ km legs for a relay. How many $\frac{1}{4}$ km legs you would have?
A. $2\frac{1}{2}$ B. 45 C. 42 D. 39 E. None of the above
- To the **nearest km/h**, what is the average rate of speed when you travel 847 km in 7 h?
A. 109 km B. 120 km C. 122 km D. 121 km E. None of the above
- Your wall is 15 m wide and 9m tall. You want to position a picture in the middle of the wall. The picture is 150 cm wide and 50 cm tall. **How far from the left edge would the picture be hung?**
A. 6.75 m B. 6.5 m C. 4.5 m D. 450 cm E. None of the above
- To get into the Fantasy Ride at your favorite amusement park, you must be at least 130 cm tall. Which of these represents the height requirement for the ride?
A. $h < 130$ B. $h \leq 130$ C. $h > 130$ D. $h \geq 130$ E. None of the above
- If four out of six people sneeze when they smell lavender, how many people would sneeze out of 630?
A. 105 B. 210 C. 420 D. 315 E. None of the above
- There is a sale at Vid-Mart. The sign says an extra 15% off the sales price. You find a game discounted 20% from the original \$18. What will the cost of the game be after the extra 15% off?
A. \$15.30 B. \$12.40 C. \$11.40 D. \$16.90 E. None of the above
- What is the solution to the following? $\frac{2}{3} - \frac{5}{6}\left(3 - \frac{1}{3}\right) + \frac{3}{4}$
A. $-\frac{29}{36}$ B. $-\frac{83}{36}$ C. $\frac{29}{36}$ D. $\frac{-21}{36}$ E. None of the above
- At a discount store, James offered a salesperson \$1,240 for a refrigerator. The offer includes the 9% sales tax. If the offer is accepted, what would be the price of the furniture, to the nearest dollar, be before the 9% tax is applied to bring the cost to \$1,240 as offered?
A. \$1,137 B \$1,138 C. \$1,351 D. \$1,352 E. None of the above

9. You can work out at Johnny's Gym for \$7 a visit, as long as you have paid your monthly dues of \$20. You want to get fit for the summer but only have \$435. If you only make one visit per day and Johnny's is open 7 days a week, what is the maximum number of workout visits you can afford in the month of June and July?

- A. 54 B. 56 C. 52 D. 53 E. None of the above

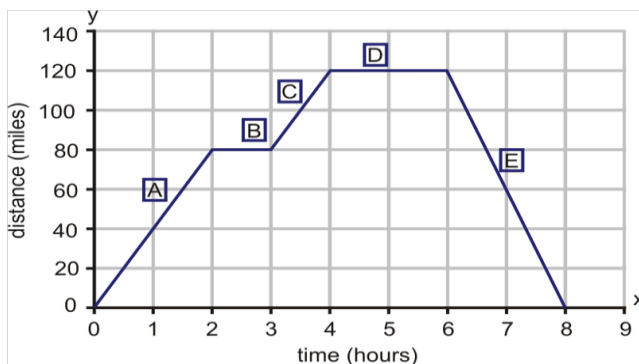
10. 72 Insect traps cost \$36 at the Professional Lawn Care Outlet. How much would 40 insects traps cost?

- A. \$18.00 B. \$19.00 C. \$20 D. \$21 E. None of the above

11. Bethy is making her favorite salad. She uses a number of cherry tomatoes proportional to the number of black olives; she likes the way they taste. For every 3 black olives Bethy uses one cherry tomato. Which equation represents the relationship between the number of cherry tomatoes, c , and the number of black olives, b , she uses?

- A. $c = \frac{3}{1}b$ B. $c = \frac{1}{3}b$ C. $b = \frac{1}{3}c$ D. $b = \frac{2}{3}c$ E. None of the above

12. What is the rate of change in miles per hour of part E shown in the graph where distance is a function of time?



- A. 65 mph
B. 60 mph
C. 55 mph
D. 70 mph
E. None of the above

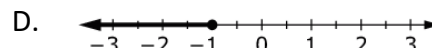
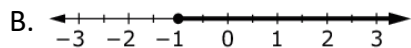
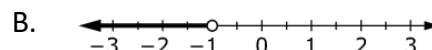
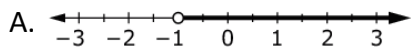
13. What is the value of: $\frac{5}{6} + \left(4\frac{8}{12}\right) - (-6)$

- A. $-1\frac{1}{2}$ B. $11\frac{1}{2}$ C. $1\frac{1}{2}$ D. $-\frac{1}{6}$ E. None of the above

14. Tree trim cost \$0.74 a foot, how much would 8 yards cost?

- A. \$9.92 B. \$10.81 C. \$17.76 D. \$9.93 E. None of the above

15. What is the solution to the inequality: $7x + 10 < 3$



E. None of the above

16. What is the value of $4.3(3 + 19)$

- A. 94.6 B. 68.8 C. 31.9 D. 88.3 E. None of the above

17. Which procedure shows how to find an **increase of 17%** on the original cost of \$45?

- A. Multiply \$45 by 0.17 B. Divide \$45 by 0.17
C. Multiply \$45 by 1.17 D. Divide \$45 by 1.17
E. None of the above

18. Which expression is the same as $-60(h - 7)$?

- A. $-60h - 490$ B. $60h + 420$ C. $-60h + 490$ D. $-60h - 420$ E. None of the above

19. One gallon of cinder block sealant (waterproofing) will cover 650 sq. ft. If you used **2 gallons** to seal a wall for retaining the earth under your deck, which of the following dimensions could you **NOT** have sealed with your 2 gallons?

- A. 30 ft. by 40 ft. B. 40 ft. by 40 ft. C. 35 ft. by 30 ft.
D. 36 ft. by 36 ft. E. None of the above

20. Which number would you have to divide $\frac{1}{3}$ by to give you a value of less than $\frac{1}{4}$?

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

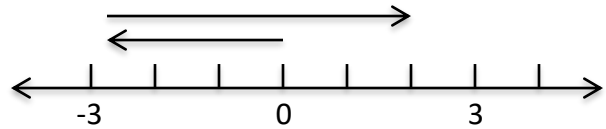
21. What is the constant of proportionality represented by the following points (x, y).
(5, 65), (7, 91), (6, 78), (8, 104)

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

22. You are going to double the cleaner mix that calls for $\frac{4}{5}$ cup vinegar. How much vinegar will you add?

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

23. Which problem is represented by the graph?



- A. $-2\frac{1}{2} - 4\frac{1}{2}$ B. $-2\frac{1}{2} + 4\frac{1}{2}$ C. $-2\frac{1}{2} + 2$ D. $-2\frac{1}{2} \left(4\frac{1}{2}\right)$
 E. None of the above

24. What is the next number in the sequence if the pattern continues? -3, 9, -27, 81, ____

- A. 253 B. -253 C. 243 D. -243 E. None of the above

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

Student	Exam Pts
A	70
B	210
C	180
D	90
E	150
Total	_____

25. What percent of the total points (pts) did Student E have?

- A. 21.4% B. 14.3% C. 16.7% D. 50% E. None of the above

26. What fraction of the total points do Student A and B hold together?

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

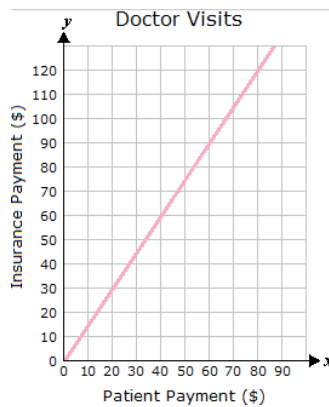
27. Which statement is **NOT** true based on the data?

- A. Student A has a third of the points as Student B.
 B. Student C had six-sevenths the number of points as Student B.
 C. Student D has half as many points as Student C.
 D. Students D has three-fifths as many points as Student E.
 E. All of the statements are correct.

28. If Student A doubles his class points, what **percent increase** is this of the class total?

- A. 17.4% B. 200% C. 10.0% D. 8.0% E. None of the above

Use the graph for problems #29-31. The graph shows the proportional relationship between the Insurance Payments for Doctors Visits and Patient Payments.



29. What is the ratio of Insurance Payments to Patient Payments?
 A. 2:3 B. 2:1 C. 1.5 D. 3:2 E. None of the above
30. What is the meaning of the point (60, 90)?
 A. The insurance will pay \$60 while the patient pays \$90.
 B. The insurance will pay \$90 while the patient pays \$60.
 C. The patient will pay \$90 while the insurance pays \$60.
 D. The patient pays as much as the insurance.
 E. None of the above
31. If the patient paid \$75, what would the insurance have paid?
 A. \$75 B. \$150 C. \$112.50 D. \$50 E. None of the above
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32. If the entry to an arcade is \$4 and the cost of a play is \$0.25, how many plays did you get on if you spent a total of \$16?
 A. 48 plays B. 64 plays C. 16 plays D. 80 plays E. None of the above
33. For every $\frac{2}{5}$ cup of blueberries, Cecilia uses $\frac{1}{5}$ cup of water. How much water will she need if she uses $2\frac{2}{5}$ cups of blueberries?
 A. 3 cups B. 4 cups C. 6 cups D. 2 cups E. None of the above
34. What is the **GCF** of: 35, 28, and 42?
 A. 6 B. 7 C. 14 D. 5 E. None of the above
35. Simplify using the order of operations: $-4(5 - 11)/3 + 13 \times 4$
 A. 60 B. 44 C. -44 D. -60 E. None of the above

36. You have \$7 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	\$0.50
Paper	\$0.70 (100 sheets)
Binder	\$1.50
Pencils	\$0.75 per package

A. 6 pens and 3 binders
B. 2 binders and 500 sheets of paper
C. 4 packages of pencils and 3 binders
D. 3 pens, 200 sheets of paper, and 3 binders
E. None of the above

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

- A. $-1\frac{7}{20}$ 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: 0.7 pounds = _____ grams (1 pound \approx 454 grams)

- A. 317 grams B. 648.6 grams C. 112 grams D. 317.8grams E. None of the above

39. What is the value of $\left(3\frac{1}{2}\right)\left(\frac{2}{7}\right)\left(\frac{7}{12}\right)$?

- A. $\frac{1}{4}$ B. $2\frac{2}{7}$ 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

1. A C D E

2. A B C E

3. B C D E

4. A B C E

5. A B D E

6. A B C D E

7. B C D E

8. A C D E

9. A C D E

10. A B D E

11. A C D E

12. A 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 C D 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. A B D E

40. A C D E