Kansas City Area Teachers of Mathematics
2014 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 _____

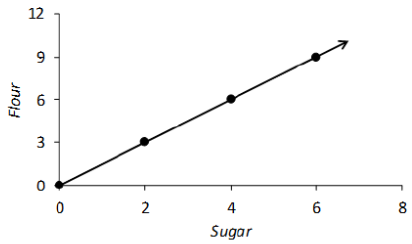
School _____

Use the ratio table and the coordinate plane graph for problems #1-4.

Ratio Table

Sugar	Flour
2	3
4	6
6	9

Coordinate Plane



1. The information in the ratio table and in the coordinate plane graph can be written as an equation in the form of **y = kx**. What would be the equation for the data above?
   A. y = 1x B. y = (1/2)x C. y = (2/3)x D. y = (3/2)x E. None of the above

2. Using the data from the table, the graph, and the equation in the form of y = kx, what does the "k" represent?
   A. The amount of sugar and flour used in a recipe.
   B. The ratio of sugar to flour used in a recipe.
   C. The ratio of flour to sugar used in a recipe.
   D. The rise and run on the graph.
   E. None of the above

3. If you were to continue the data, what would be the amount of flour when the amount of sugar is 14?
   A. 15 B. 21 C. 24 D. 30 E. None of the above

4. Write the coordinate pair for the value of flour when the value of sugar is 3.

   A. (3, 4.5) B. (4.5, 3) C. (3, 5) D. (5, 3) D. None of the above

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5. What is the unit rate of miles per hour if a family travels 200 miles in 2 ½ hours?
   A. 70 miles per hour B. 75 miles per hour C. 78 miles per hour
   D. 80 miles per hour E. None of the above

6. Find the smaller of 2 consecutive integers if the sum of the smaller and twice the larger is -4.

   A. -3 B. -4 C. -2 D. -1 E. None of the above

7. Tillman, an English Bulldog, holds the World's Record for being the fastest dog on a skateboard. The record breaking time was 19.68 seconds for 100 meters. Lightning, another dog, tried to break Tillman's record. Lightning traveled 75 meters in 15.5 seconds. Was Lightning able to capture the new World Record?
(check out the YouTube videos.)

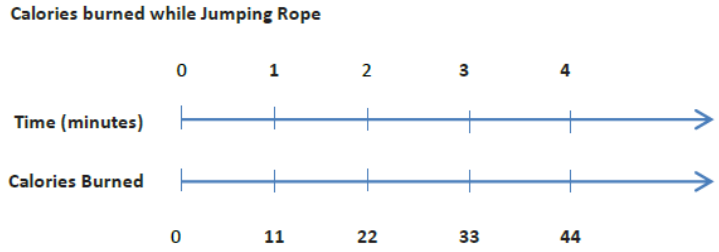
A. Yes B. No C. Lightning tied the World Record
D. Not enough information to determine the results E. None of the above

8. Four customers purchased yogurt at a self-serve location. The table of values below shows the data. Determine the cost of the yogurt per ounce.

Weight (ounces)	12.5	10	5	8
Cost ($)	5	4	2	3.20

B. $0.35 B. $0.38 C. $0.40 D. $0.42 E. None of the above

9. During Jose's physical education class, the students visited activity stations. Next to each station was a chart depicting how many average calories would be burned by completing the activity. Use the jump roping chart below to determine how many calories Jose burned in 6.5 minutes of jumping rope.



A. 55 calories
B. 66 calories
C. 69.5 calories
D. 71.5 calories
E. None of the above

10. Determine if the snowfall recorded below for 5 cities in the metropolitan area is proportional. If the answer is yes, what is the equation that can be used to report the data?

x Time (h)	*y* Snowfall(in)
2	10
6	12
8	16
2.5	5
7	14

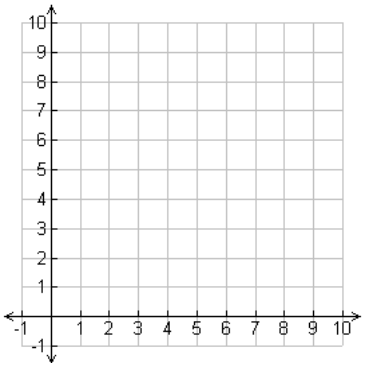
A. No, snowfall is not proportional for all of the cities.
B. Yes, the equation would be y = 2x
C. Yes, the equation would be y = 2.5 x
D. Yes, the equation would be y = 5x
E. None of the above

11. If 4 pair of socks cost $4.24, what would 7 pair of socks cost?

A. $7.05 B. $7.25 C. $7.42 D. $7.63 E. None of the above

12. The following table gives the number of people picking strawberries in a field and the corresponding number of hours that these people worked picking strawberries. Graph the data. Determine which of the following statements is true based on the information you have.

x	y
1	3
7	1
4	2



A. The data shows a proportional relationship between the number of people and the number of hours the people worked.
B. The graph shows that as the number of people increased, the amount of hours decreased.
C. The graph shows that as the number of people increased, the amount of hours increased.
D. The data shows that there is no relationship between the number of people and the number of hours worked.
E. None of the above

13. What is the **LCM** of 12 and 18?

A. 216 B. 6 C. 72 D. 36 E. None of the above

14. What is the **GCF** of 144 and 90?

A. 12,960 B. 36 C. 18 D. 9 E. None of the above

15. What is the **sum** of: $\frac{2}{3}+\frac{4}{5}+\frac{1}{6}$?

A. $\frac{1}{2}$ B. $1\frac{19}{30}$ C. $1\frac{7}{30}$ D. $2\frac{1}{30}$ E. None of the above

16. Which number is **NOT** divisible by 6?

A. 21,006 B. 6,402 C. 7,110 D. 36,212 E. None of the above

17. Which **properties** were used to solve the two step equation: $3x - 5 = 16$?

A. Associative Property of Addition and the Addition Property of Equality
B. Multiplication Property of Equality and the Subtraction Property of Equality
C. Subtraction Property of Equality and the Distributive Property
D. Addition Property of Equality and the Division Property of Equality
E. None of the above

18. Which is the **prime factorization** of 156?

A. $2^2 \times 3 \times 13$ B. $2^3 \times 13$ C. $2^4 \times 3^2$ D. $2^2 \times 3 \times 11$ E. None of the above

19. The angles of a triangle have a ratio of 1:2:3, what are the degrees of the angles?

A. $40^o, 50^o, 90^o$ B. $30^o, 60^o, 90^o$ C. $20^o, 70^o, 90^o$
D. $25^o, 50^o, 75^o$ E. None of the above

20. Courtney weighs 100 pounds. If 1 kg is approximately 2.2 pounds, what would Courtney's weight be in kilograms? Round to the nearest hundredth.

A. 45.5 kg B. 45.45 kg C. 50.20 kg D. 47.47 kg E. None of the above

21. Convert: $2\frac{1}{10}$ miles = _____ feet (1 mile = 5280 ft.)

A. 11,088 ft. B. 10,560 ft. C. 13,200 ft. D. 430 yds. E. None of the above

22. Convert 30 kilometers per hour into meters per second. Which of the following procedures would you follow?

A. $\frac{30km}{1hr}\cdot\frac{1hr}{60\min}\cdot\frac{1\min}{60\sec}$ B. $\frac{30km}{1hr}\cdot\frac{100m}{1km}\cdot\frac{1hr}{60\min}\cdot\frac{1\min}{60\sec}$

C. $\frac{30km}{1hr}\cdot\frac{1hr}{60\min}\cdot\frac{1\min}{60\sec}\cdot\frac{1000km}{1m}$ D. $\frac{30km}{1hr}\cdot\frac{1hr}{60\min}\cdot\frac{1\min}{60\sec}\cdot\frac{1000m}{1km}$

E. None of the above

23. You are training for a marathon, so your trainer has given you a running schedule for one week: Monday: 6 ½ miles, Tuesday and Wednesday: 8 ¾ miles; Thursday: 12 miles; Friday: 6 ¼ miles, Saturday: 18 miles, and Sunday: rest. How many miles did you run that week?

A. 58.5 miles B. 59.75 miles C. 60.25 miles D. 61.5 miles E. None of the above

24. What is the value of $\frac{\frac{7}{8}}{\frac{5}{6}}$?

A. $\frac{20}{21}$ B. $\frac{35}{48}$ C. $1\frac{1}{20}$ D. $\frac{13}{24}$ E. None of the above

25. What is the value of $\left(3\frac{3}{4}\right)\left(\frac{2}{5}\right)\left(\frac{1}{12}\right)$?

A. $\frac{1}{8}$ B. $3\frac{6}{240}$ C. $\frac{3}{5}$ D. $6\frac{1}{20}$ E. None of the above

Use the notation below for problems #24-26.
N = {Natural #}; W = {Whole #}; Int. = {Integers}; Irr. = {Irrational}; Rat.={Rational}; Real = {Real #}

26. The number: π is a member of which set(s)?

A. Rat.,Real B. Irr., Real C. Int., Rat., Real D. N E. None of the above

27. ***{Even integers}*** is a subset of which sets? Choose the most complete answer.

A. N, W B. Int., Rat., Real C. W,Int.,Rat.,Real
D. Real E. None of the above

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28. The repeating number: 0.11111… is which rational number?

A. $\frac{1}{11}$ B. $\frac{2}{9}$ C. $\frac{2}{7}$ D. $\frac{1}{9}$ E. None of the above

29. Which is a better buy and why?

3 ½ lbs. of ham for ten and one-half dollars **OR** 2 ½ lbs. of ham for six and one-quarter dollars

A. 3 ½ lbs. of ham for ten and one-half dollars because it is cheaper per pound.
B. 2 ½ lbs. of ham for six and one-quarter dollars because it is cheaper per pound.
C. 3 ½ lbs. of ham for ten and one-half dollars because it is more ham and the larger size is always cheaper.
D. Both are the same price.
E. None of the above

30. Ms. Beck wants to make a shelf with boards that are $1\frac{1}{3}$ feet long. If she has an 18 foot board, how many usable pieces of shelving can she cut from the board?

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

31. "Just Sweets" uses 1.75 cups of flour in each batch of chocolate chip cookies. The bakery used 5.25 cups of flour this morning, how many batches of chocolate chip cookies did "Just Sweets" make?

A. 2.5 B. 3.5 C. 4 D. 4.5 E. None of the above

32. One-half of one-half of one-third of 144 is equivalent to:

A. 12 B. 36 C. 28 D. 6 E. None of the above

33. $\left(\frac{2}{3}\right)^{-2}$ is **NOT** equivalent to which value?

A. 2.25 B. $\left(\frac{4}{9}\right)^{-1}$ C. $\left(\frac{3}{2}\right)^{2}$ D. $\frac{9}{4}$ E. None of the above

34. You have a coupon for an additional 10% off of the final sale prices. The store is having a 20% off of your purchases from 7am to noon. If you shop at 10am and want to buy the following items: $34 pair of pants, $8 t-shirt, $28 sandals, **what would be your savings** that the cashier will share with you so you will return. ☺

A. $19.60 B. $30 C. $21 D. $20.90 E. None of the above

35. Which **fraction** does **NOT** represent the decimal: 0.035 ?

A. $\frac{35}{100}$ B. $\frac{35}{1000}$ C. $\frac{7}{200}$ D. $\frac{3.5}{100}$ E. None of the above

36. What is the **next number** in the sequence: 2, 3, 7, 14, 24, ___ ?

A. 34 B. 37 C. 38 D. 44 E. None of the above

37. A marketing ploy is a business may mark up their prices prior to advertising a sales event. If profit is figured by the formula: **PROFIT = SALES PRICE – ORIGINAL PRICE**, what would be the profit if a company ***marks up*** a $2400 couch by 1/3 and then ***sells it*** at a 20% discount?

A. $800 B. $480 C. $640 D. $160 E. None of the above

38. Two numbers have a difference of 7 and one number is 5 more than twice the other. What is the larger number?

A. 17 B. 23 C. 15 D. 9 E. None of the above

39. Which expression shows **three consecutive integers?**

A. n + 1, n + 3, n + 5 B. n, n + 1, n + 3 C. n - 1, n, n + 1
D. n, n + 2, n + 4 E. None of the above

40. In two years, Orion will be twice as old as his nephew Jordan. The sum of their current ages is 53. How old will Orion be in 2 years?

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