Kansas City Area Teachers of Mathematics
2016 KCATM Math Competition

ALGEBRAIC REASONING AND DATA
GRADE 4

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.

- Time limit: **15 minutes**

- You **may use calculators** on this test.

- Use **3.14** as the approximation for pi.

- Mark your answer on the answer sheet by **FILLING in the CIRCLE**.

- You **may not use rulers, protractors, or other measurement devices** on this test.

Student Name _____   Student Number _____

School _____

101. A rectangular pool is 7 feet wide. **It is 3 times as long as it is wide.** Use the diagram to help you **find the dimensions** of the pool, then find the **perimeter**.

A. Width = 3 ft,; length = 9 ft.; Perimeter = 27 ft.

B. Width = 7 ft,; length = 10 ft.; Perimeter = 70 ft.

C. Width = 7 ft,; length = 21 ft.; Perimeter = 56 ft.

D. Width = 3 ft,; length = 21 ft.; Perimeter = 63 ft.

E. None of the above

Use the following rectangle to answer #102-103. Determine the <u>perimeter</u> and <u>area</u> of the rectangle.
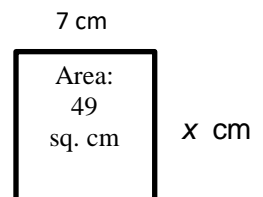
7 cm

3 cm
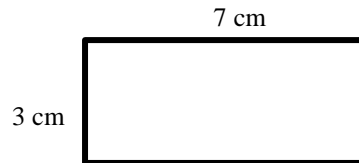
102. What is the **perimeter** of the rectangle?

   A. 10 cm   B. 21 cm   C. 23 cm   D. 20 cm   E. None of the above

103. What is the **area** of the rectangle?

   A. 10 sq. cm   B. 21 sq. cm   C. 23 sq. cm   D. 20 sq. cm   E. None of the above

7 cm

104. Given a rectangle's area is 49 square centimeters and one side is 7 cm, **find the unknown side length, x.**

Area: 49 sq. cm

x cm

A. x = 7 cm   B. x = 42 cm   C. x = 56 cm

D. x = 14 cm   E. None of the above

105. At the school cafeteria, each student who ordered lunch gets 6 chicken nuggets. The cafeteria staff prepares enough for 300 kids. **How many chicken nuggets does the cafeteria staff prepare altogether?**

A. 180 chicken nuggets   B. 18,000 chicken nuggets
C. 1,900 chicken nuggets   D. 1,800 chicken nuggets
E. None of the above

106. Use the function machine to **find the value of output "y"** when the input for "x" is 4.

$x = 4$

$y = 2x + 3$

$y =$
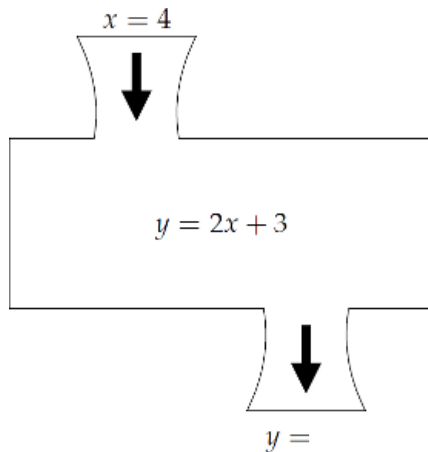
A. 11

B. 9

C. 5

D. 1

E. None of the above

107. What is the product of 8 and 54?

    A. 6   B. 62   C. 512   D. 432   E. None of the above

108. Four thousand pencils were donated to an elementary school. If 8 classrooms shared the pencils equally, how many pencils did each class receive?

    A. 200 pencils   B. 500 pencils   C. 400 pencils
    D. 480 pencils   E. None of the above

109. Dr. Casey has 1,868 milliliters of Medicine T. She poured equal amounts of the medicine into 4 containers. **How many milliliters of medicine are in each container?**

    A. 1,872 milliliters   B. 647 milliliters   C. 467 milliliters
    D. 1,467milliters   E. None of the above

110. Jaelynn has 30 times as many stickers as her brother. Her brother has 8 stickers.
How many stickers does Jaelynn have?

A. 110   B. 240   C. 24   D. 90   E. None of the above

111. If each letter of the alphabet is assigned a number starting with A = 1, B = 2, etc., the values of the letters in the alphabet will start to look like this:

A	B	C	D	E	F	G	H	I	J	K	L	M
1	2	3	4	5	6	7	8	9	0	11	12	13
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
14	15	16	17	18	19	20	21	22	23	24	25	26

If your code is the **sum** of the letter values, what is the value of **"Mathematics"**?

A. 112   B. 103   C. 110   D. 93   E. None of the above

112. Anna solved the following division problem by drawing an area model.
What division problem is represented?
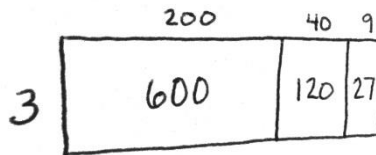
A. 747 ÷ 3 = 24   B. 727 ÷ 3 = 242   C. 747 ÷ 3 = 249
D. 3 ÷ 627 = .004   E. None of the above

113. The flower shop has 40 times as many flowers in one cooler as Julia has in her bouquet. The cooler has 120 flowers. **How many flowers are in Julia's bouquet?**

A. 3 flowers   B. 48 flowers   C. 30 flowers
D. 24 flowers   E. None of the above

114. What is the **greatest common factor, GCF**, of 18 and 24?

A. 4   B. 6   C. 8   D. 12   E. None of the above

115. Meliza has 43 toy soldiers**. She lines them up in rows of 5** to march in an imaginary parade. **How many of these rows can she make?** After making as many rows of 5 as she can, she puts the remaining soldiers in the last row. **How many soldiers are in the last row?**

    A. 20 rows; 3 soldiers   B. 4 rows; 2 soldiers   C. 8 rows; 3 soldiers
    D. 8 rows; 8 soldiers   E. None of the above

116. **Which inequality below is true?**

    A. 10 yards < 360 inches   B. 2 kilograms > 2,600 grams
    C. 12 feet < 140 inches   D. 10 kilometers < 11,000 meters
    E.   None of the above

117. **Which inequality below is <u>NOT</u> true?**

    A.   4 kilograms < 4,100 grams   B. 10 liters > 100,000 milliliters
    C.   12 yards < 40 feet   D. 3 ft. > 30 inches
    E. None of the above

118. **Solve for n: 2n + 4 = 26**

    A. 15   B. 11   C. 135   D. 99   E. None of the above

Use the number line below for problems #119 and #120.
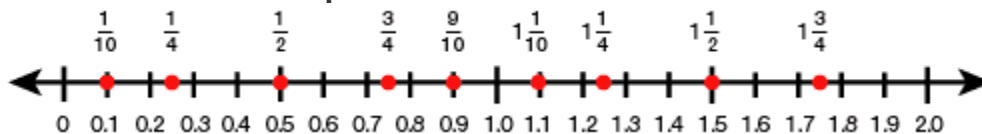
119. What is the **decimal value of** $\frac{1}{4}$ **?**

A. 1.25   B. 1.7   C. 1.8   D. 1.75   E. None of the above

120. What is the **fraction that represents 0.75?**

    A. $\frac{3}{2}$ B. 1   C. $\frac{3}{4}$ D. $1\frac{3}{8}$ E. None of the above

121. Helen has 4 yards of rope. Daniel has 4 times as much rope as Helen. **How many <u>more feet of rope</u> does Daniel have compared to Helen?**

    A. 60 feet   B. 16 feet   C. 36 feet   D. 48 feet   E. None of the above

122. There are 60 seconds in a minute and 60 minutes in an hour. **How many seconds are in one hour?**

    A. 360 seconds   B. 3,600 seconds   C. 120 seconds
    D. 1,200 seconds   E. None of the above

123. Amaya read 64 pages last week. Amaya's older brother, Rogelio, read twice as many pages in the same amount of time. Their big sister, Elianna, is in high school and read 4 times as many pages as Rogelio did. **How many pages did Elianna read last week?**

  A. 512 pages   B. 256 pages   C. 128 pages   D. 132 pages   E. None of the above

124. A number increased by 10 is 15. **What is the number?**

  A. 25   B. 5   C. 105   D. 15   E. None of the above

125. To print a comic book, 50 pieces of paper are needed. **How many pieces of paper are needed to print 40 comic books?**

    A. 900 pieces of paper   B. 90 pieces of paper
    C. 200 pieces of paper   D. 2,000 pieces of paper
    E. None of the above

126. The table shows the number of stickers of various types in Chrissy's new sticker book. Chrissy's six friends each own the same sticker book. **How many stickers do Chrissy and her six friends have altogether? Select the equation that is NOT a solution.**

Type of Sticker	Number of Stickers
flowers	32
smiley faces	21
hearts	39

A. (7 x 32) + (7 x 21) + (7 x 39) = 644   B. (32 + 21 + 39) 6 = 644
C. 7(32 + 21 + 39) = 644   D. (32 + 21 + 39) x (6 +1) = 644
E. None of the above

127. **Solve this proportion:** $\frac{x}{45} = \frac{1}{9}$

   A. 3   B. 4   C. 5   D. 6   E. None of the above

128. Ian earned "*e*" extra credit points on his project. Tim earned 10 fewer extra credit points than Ian. **Choose the expression that shows how many extra credit points Tim earned.**

   A. e   B. 10 - e   C. 10 + e   D. e - 10   E. None of the above

129. What is the next number in the pattern: -34, 30, -26, 22, -18, 14

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

130. Every day at the bagel factory, Cyndi makes 5 different kinds of bagels. If she makes 144 of each kind, **what is the total number of bagels that she makes each day**?

   A. 576 bagels   B. 149 bagels   C. 720 bagels
   D. 288 bagels   E. None of the above

131. A small bag of chips weighs 48 grams. A large bag of chips weighs three times as much as the small bag. **How much will 7 large bags of chips weigh?**

   A. 1,008 g   B. 347.22 g   C. 562.50 g   D. 112.50 g   E. None of the above

132. Which of the following numbers is **NOT** prime?

   A. 1   B. 2   C. 13   D. 29   E. All are prime

133. **Which number would complete this sequence?** 82,030, 72,030, 62,030, ___

   A. 82,030   B. 82,031   C. 62,031   D. 72,032   E. None of the above

134. Jaime had "*m*" downloaded songs. His mother bought him 25 more songs.
   Choose the expression that shows how many songs Jaime has now.

   A. *m – 25*   B. *m + 25*   C. *m*   D. *25 – m*   E. None of the above

135. **Find the solution for "*y*" when 4 = 22 − 6y**

     A. y = 10   B. y = 26   C. y = 4   D. y = 3   E. None of the above

136. **Find five consecutive multiples of 4 starting from 40.**

     A.   40, 43, 47, 51, 55   B. 40, 45, 49, 53, 57   C. 40, 44, 48, 52, 56
     D.   41, 46, 50, 54, 56   E. None of the above

137. Mark had $25,081 in his bank account on Thursday. On Friday, he added his paycheck to the bank account, and he then had $26,010 in the account. **What was the amount of Mark's paycheck?**

     A. $929   B. $51,091   C. $1,070   D. $71   E. Not given

138. Jake ran 2 miles. Jesse ran 4 times as far as Jake. There are 5,280 feet in a mile.
      How many feet did Jesse run?

     A. 10,560 ft.   B. 31,680 ft.   C. 21,120 ft.   D. 42,240 ft   E. None of the above

Use the associative property to find the missing factors of 24 and 36. (139-140)

139. $24 = 12 \times 2$
         $= (\underline{\quad} \times 3) \times 2$
         $= \underline{\quad} \times (3 \times 2)$
         $= \underline{\quad} \times 6$
         $= \underline{\quad}$

    A. 4; 4; 4; 24
    B. 6; 6; 6; 24
    C. 3; 3; 3; 24
    D. 2; 2; 4; 24
    E. None of the above

140. $36 = \underline{\quad} \times 4$
      $= (\underline{\quad} \times 3) \times 4$
      $= \underline{\quad} \times (3 \times 4)$
      $= \underline{\quad} \times 12$
      $= \underline{\quad}$

    A. 6; 9; 2; 3; 36
    B. 3; 3; 9; 3; 36
    C. 9; 3; 3; 3; 36
    D. 6; 3; 3; 3; 36
    E. None of the above

Shade the correct answer!

Example: A   ●   C   D   E

Name_____

School _____

101.	A	B	C	D	E	121.	A	B	C	D	E
102.	A	B	C	D	E	122.	A	B	C	D	E
103.	A	B	C	D	E	123.	A	B	C	D	E
104.	A	B	C	D	E	124.	A	B	C	D	E
105.	A	B	C	D	E	125.	A	B	C	D	E
106.	A	B	C	D	E	126.	A	B	C	D	E
107.	A	B	C	D	E	127.	A	B	C	D	E
108.	A	B	C	D	E	128.	A	B	C	D	E
109.	A	B	C	D	E	129.	A	B	C	D	E
110.	A	B	C	D	E	130.	A	B	C	D	E
111.	A	B	C	D	E	131.	A	B	C	D	E
112.	A	B	C	D	E	132.	A	B	C	D	E
113.	A	B	C	D	E	133.	A	B	C	D	E
114.	A	B	C	D	E	134.	A	B	C	D	E
115.	A	B	C	D	E	135.	A	B	C	D	E
116.	A	B	C	D	E	136.	A	B	C	D	E
117.	A	B	C	D	E	137.	A	B	C	D	E
118.	A	B	C	D	E	138.	A	B	C	D	E
119.	A	B	C	D	E	139.	A	B	C	D	E
120.	A	B	C	D	E	140.	A	B	C	D	E

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

Name_____

School _____

ANSWER KEY

101.	A	B	●	D	E		121.	A	B	●	D	E
102.	A	B	C	●	E		122.	A	●	C	D	E
103.	A	●	C	D	E		123.	●	B	C	D	E
104.	●	B	C	D	E		124.	A	●	C	D	E
105.	A	B	C	●	E		125.	A	B	C	●	E
106.	●	B	C	D	E		126.	A	●	C	D	E
107.	A	B	C	●	E		127.	A	B	●	D	E
108.	A	●	C	D	E		128.	A	B	C	●	E
109.	A	B	●	D	E		129.	A	B	C	●	E
110.	A	●	C	D	E		130.	A	B	●	D	E
111.	●	B	C	D	E		131.	●	B	C	D	E
112.	A	B	●	D	E		132.	●	B	C	D	E
113.	●	B	C	D	E		133.	A	B	C	D	●
114.	A	●	C	D	E		134.	A	●	C	D	E
115.	A	B	●	D	E		135.	A	B	C	●	E
116.	A	B	C	●	E		136.	A	B	●	D	E
117.	A	●	C	D	E		137.	●	B	C	D	E
118.	A	●	C	D	E		138.	A	B	C	●	E
119.	●	B	C	D	E		139.	●	B	C	D	E
120.	A	B	●	D	E		140.	A	B	●	D	E