Kansas City Area Teachers of Mathematics
2018 KCATM Math Competition

ALGEBRAIC REASONING AND DATA
GRADE 5
#101-140

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. I sold 15 cups of lemonade on Saturday and twice as many on Sunday. Which expression represents the total number of cups of lemonade I sold on both days?

A. 15 + 15
B. 2 x 15
C. 15 + (2 x 15)
D. 2 x (15 + 15)
E. None of the above

102. Each of the 18 students in Mr. Hall's class has p pencils. Which expression represents the total number of pencils that Mr. Hall's class has?

A. 18 + p
B. 18 - p
C. 18 x p
D. 18 ÷ p
E. None of the above

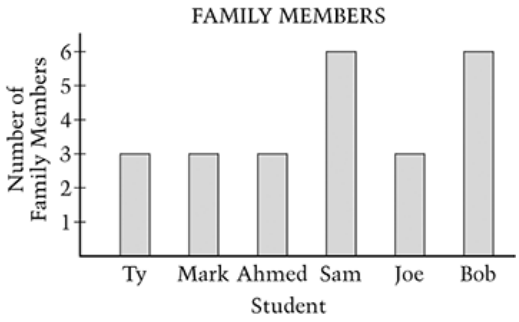
103. The three digits on the right can be used to make 6 different 3-digit numbers.
If one of the 3-digit numbers is picked at random, what are the chances that it will be an odd number?

A. Impossible
B. Possible but not very likely
C. Very likely but not certain
D. Certain
E. None of the above

104. In the pattern shown below,

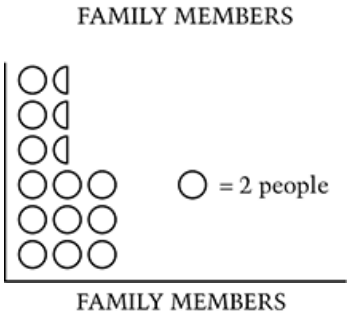
which of the following would go into the blank space?

A. ◯
B. □
C. ○
D. △
E. None of the above



105. The graph above shows the number of family members for six students. Which graph below is the best summary of the data?

A.



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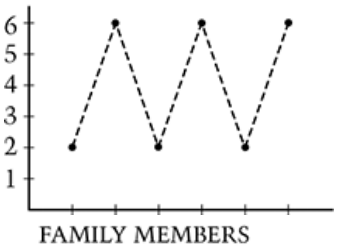

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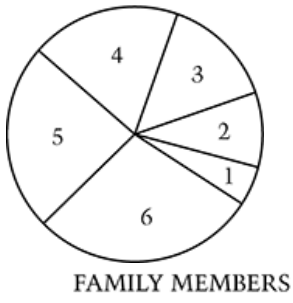

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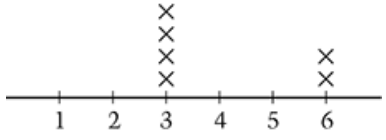


E. None of the above

106.

INPUT-OUTPUT TABLE

INPUT	OUTPUT
0	0
1	2
2	4
3	6

Which rule works for every pair of numbers in the INPUT-OUTPUT table?

A. Each OUTPUT number is equal to the INPUT number.
B. Each OUTPUT number is one more than the INPUT number.
C. Each OUTPUT number is two more than the INPUT number.
D. Each OUTPUT number is two times the INPUT number.
E. None of the above.

107. Every 30 minutes Dr. Kim recorded the number of bacteria in a test tube.

Time	Number of Bacteria
1:00 P.M.	600
1:30 P.M.	1,190
2:00 P.M.	2,390
2:30 P.M.	4,800

Which best describes what happened to the number of bacteria every 30 minutes?

A. The number of bacteria increased by 500.
B. The number of bacteria increased by 1,000.
C. The number of bacteria doubled.
D. The number of bacteria tripled.
E. None of the above

108. Sam folds a piece of paper in half once. There are 2 sections.

Sam folds the paper in half again. There are 4 sections.

Sam folds the paper in half again. There are 8 sections.
Sam folds the paper in half two more times.
Which list shows the number of sections there are each time Sam folds the paper?

A. 2, 4, 8, 10, 12
B. 2, 4, 8, 12, 24
C. 2, 4, 8, 16, 24
D. 2, 4, 8, 16, 32
E. None of the above

109. On the scale to the right, 2 cylinders balance 1 cube. Which of the scales below would balance?

A. 

B. 

C. 

D. 

E. None of the above

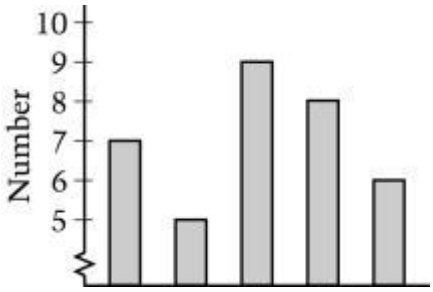
110. Waldo added 3 gm of salt to 17 gm of water. What is the percentage of salt in the solution obtained?

A. 20%
B. 17%
C. 16%
D. 15%
E. None of the above

111. The human heart beats approximately 70 times per minute. How many beats, approximately, will it make it an hour?

A. 42000
B. 7000
C. 4200
D. 700
E. None of the above.

112.



Jim made the graph above. Which of these could be the title for the graph?

A. Number of students who walked to school on Monday through Friday
B. Number of dogs in five states
C. Number of bottles collected by three students
D. Number of students in each of ten clubs
E. None of the above.

113. Consider the table below.

Column *A*	Column *B*
12 →	3
16 →	4
24 →	6
40 →	10

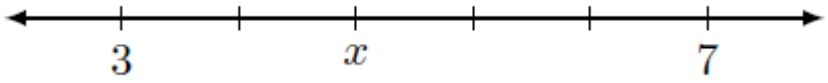
What rule is used to get the numbers in column B from the numbers in column A?

A. Divide the number in column A by 4.
B. Multiply the number in column A by 4.
C. Subtract 9 from the number in column A.
D. Add 9 to the number in column A.
E. None of the above

114. For two positive whole numbers, their sum is 11 and their product is 24. What is the larger number?

A. 3
B. 4
C. 6
D. 8
E. None of the above

115. If the tick marks in the number line below are equally spaced, what is the value of x?



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

116. There are 8 strawberry candies for every 3 chocolates. If there is a total of 64 strawberry candies, what is the number of chocolates?

A. 24
B. 22
C. 20
D. 32
E. None of the above

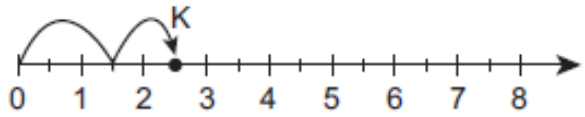
117. If the ratio of blue and green marbles is 5:8, which of the following is a possible total number of marbles?

A. 32
B. 36
C. 38
D. 39
E. None of the above

118. Which of the following expressions represents the number **one million**?

A. 10^8
B. 10^7
C. 10^6
D. 10^5
E. None of the above

119. Kara went running 3 times this week. Each time, Kara ran 2.5 miles. Which number line has point K graphed so that it best represents the total distance Kara ran, in miles?

A.


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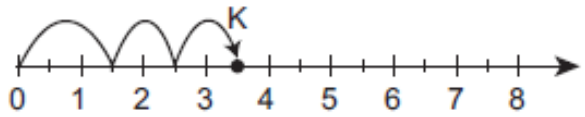

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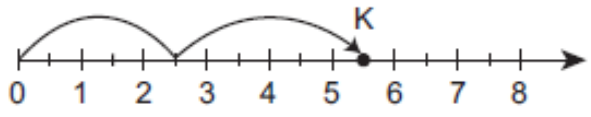

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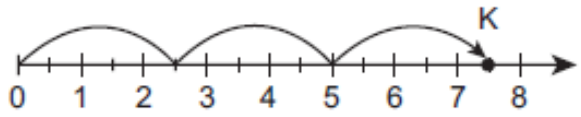


E. None of the above

120. Mr. Parabola put together 5 bags of pens. He put 19 black pens and 12 red pens in each bag. Which expression shows the total number of pens Mr. Parabola put into bags?

A. (5 × 19) + 12
B. 5 × (19 + 12)
C. 5 + (19 × 12)
D. (5 + 19) × 12
E. None of the above

121. Use the equation below to answer the question.

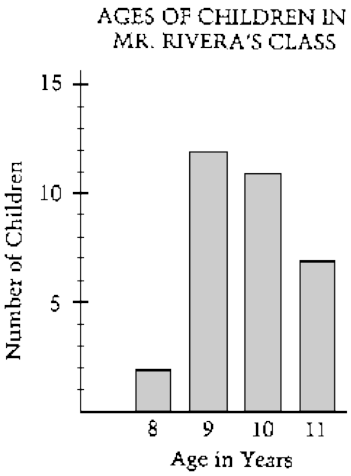
0.75 x 6.5 = m

Which expression shows one way to solve the equation?

A. 75 × 65 ÷ 1,000
B. 75 × 650 ÷ 1,000
C. 0.7 × 6 + 0.7 × 5 + 0.5 × 6 + 0.5 × 5
D. 0.7 × 6 + 0.7 × 0.5 + 0.5 × 6 + 0.5 × 0.5
E. None of the Above

122. The graph on the right shows how many of the 32 children in Mr. Rivera's class are 8, 9, 10, and 11 years old. Which of the following is true?

A. Most are younger than 9.
B. Most are younger than 10.
C. Most are 9 or older.
D. All of the above
E. None of the above



123. What is the value of the expression?

3 x [(2 x 6 - 5) + (8 ÷ 4)] -1

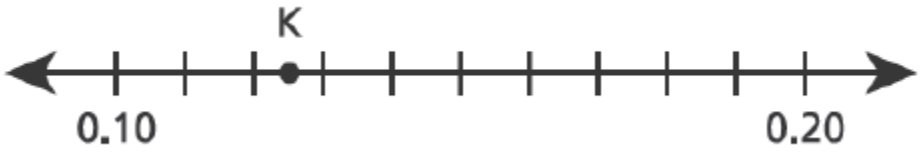
What is the value of the expression?

A. 9
B. 11
C. 26
D. 32
E. None of the above

124. For which values of K would the product of $\frac{k}{3} \times 12$ be greater than 12?

A. For any value of k less than 1 but greater than 0
B. For any value of k less than 3 but greater than 1
C. For any value of k equal to 3
D. For any value of k greater than 3
E. None of the above

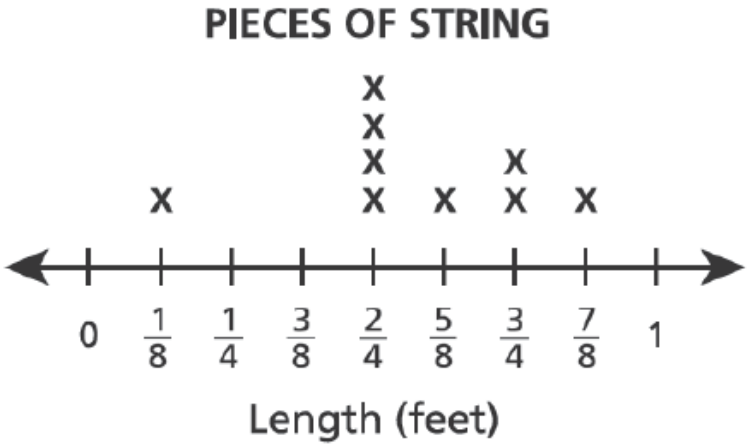
125. Point k is shown on the number line below.



Which number sentence best describes the value represented by point k?

A. $k > 0.13$
B. $k < 0.13$
C. $k = 0.15$
D. $k = 0.35$
E. None of the above

126. The line plot below shows the lengths of all the pieces of string I used for an art project. I cut all these pieces from one original piece of string.



I had 1 foot of string left over. How long, in feet, was the original piece of string?

A. $1\frac{6}{8}$
B. $1\frac{7}{8}$
C. $3\frac{7}{8}$
D. $6\frac{1}{8}$
E. None of the above

127. Sara goes to a bookstore and wants to buy a book that is originally priced at $100. Which of the following options gives her the best discounted price?

A. A discount of 20%
B. A discount of 10%, then a discount of 10% off the new price
C. A discount of 15%, then a discount of 5% off the new price
D. A discount of 5%, then a discount of 15% off the new price
E. None of the above

128. When n = 101, which of the following expressions has an even value?

A. 3n
B. n + 2
C. n – 12
D. 2n – 2
E. None of the above

129. Which integer is closest in value to $\frac{35}{4}$?

A. 7
B. 8
C. 9
D. 10
E. None of the above

130. Twix has $280 in $20 bills. How many $20 bills does Twix have?

A. 12
B. 14
C. 16
D. 18
E. None of the above

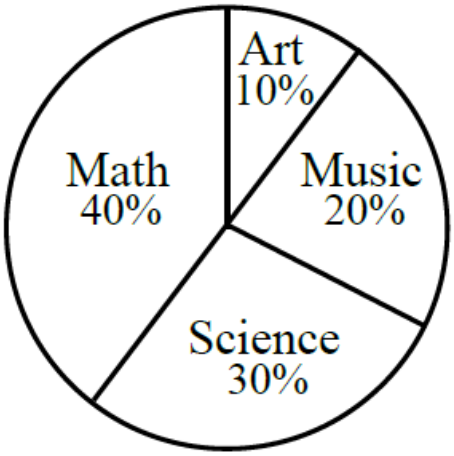
131. Points P, Q, and R are on a number line. Q is hallway between P and R. If P is at -6 and Q is at -1, then R is at
   A. 4
   B. -11
   C. 3
   D. -7
   E. None of the above

132. Kitkat pays $2.25 to take the bus. Skittles pays $3.00 to take the bus. If they each take the bus 20 times, how much less would Kitkat pay than Skittles in total?
   A. $25
   B. $10
   C. $15
   D. $45
   E. None of the above

133. In the 3 x 3 table shown, the numbers 1, 2, and 3 are placed so that each number occurs only once in each row and only once in each column. The value of X + Y is
   A. 3
   B. 4
   C. 5
   D. 6
   E. None of the above

		1
3	X	
		Y

134. At Kcatmberg School, a total of 480 students voted for their favorite subject. The results are summarized in the pie char shown. How many students voted for math?



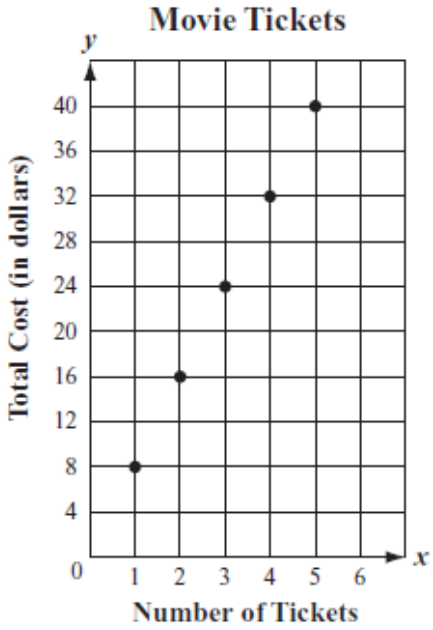
A. 192
B. 96
C. 144
D. 184
E. None of the above

135. The number 6 has exactly four positive divisors: 1, 2, 3, and 6. How many positive divisors does 20 have?
A. 2
B. 6
C. 5
D. 8
E. None of the above

136. Which one of the following is equal to 17?
A. 3 – 4 x 5 + 6
B. 3 x 4 + 5 ÷ 6
C. 3 x 4 ÷ 5 + 6
D. 3 + 4 x 5 - 6
E. None of the above

137. A farmer has 20 bins of apples. Each bin has 25 red apples and 30 green apples. Which of the following expressions can be used to find the total number of apples in all the bins?
A. 20 + (25 x 30)
B. 20 x (25 + 30)
C. (20 + 25) x (20 + 30)
D. (20 x 25) x (20 x 30)
E. None of the above

138. The graph on the right shows y, the total cost in dollars, for *x* tickets to a movie. Based on the information in the graph, what would be the total cost for 6 movie tickets?
   A. $24
   B. $40
   C. $48
   D. $64
   E. None of the above



139. Which of the following numbers would make the equation shown below correct?

5 x (13 - __) ÷ 2 = 15

   A. 1
   B. 5
   C. 7
   D. 9
   E. None of the above

140. What is the expanded form of 68,025?
   A. 60,000 + 800 + 25
   B. 60,000 + 8000 + 20 + 5
   C. 60,000 + 80000 + 20 + 5
   D. 60,000 + 8000 + 200 + 5
   E. None of the above