# Kansas City Area Teachers of Mathematics
# 2017 KCATM Math Competition

# ALGEBRAIC REASONING
# GRADE 5

**INSTRUCTIONS**

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

- Time limit: **15 minutes**
- You **may use calculators** on this test.
- Use the $\pi$ **key** on your calculator **or 3.14** as the approximation for pi.
- Mark your answer on the answer sheet by **FILLING in the oval**.
- You **may not use rulers, protractors, or other measurement devices** on this test.

Student Name _____

School _____

101. If four times a number is 112, what is the number?

A. 448 B. 108 C. 38 D. 28 E. None of the above

102. Jonathon is five more than twice his step-brother's age. Jonathon is 15, how old is his step-brother?

A. 35 B. 10 C. 5 D. 25 E. None of the above

103. Alvin the Chipmunk has been on radio, TV, and in the movies since 1958 when they debuted their first album. Which expression gives the correct difference between this year's date and 1958?

A. 34 x 2 – 10 B. (28 – 5) x 2 + 11 C. (13 x 4) + 8
D. (43 – 15) x 2 + 3 E. None of the above

104. Your teacher asked you to complete the following number of problems: 7(5 – 3). How many problems did you teacher ask you to do?

A. 35 B. 12 C. 9 D. 32 E. None of the above

105. The temperature in March ranged from $21^{o}$ to $77^{o}$ in the Kansas City area. Which operation gives you a composite number that does not give you a whole number?

A. 77 – 21 B. 77/ 21 C. 77 + 21 D. 77 x 21 E. None of the above

106. Twelve less than twice a number is 8. What is the number?

A. 12 B. 11 C. 10 D. 4 E. None of the above

107. The point (-3,4) is in which quadrant?

A. I B. II C. III D. IV E. None of the above

108. If you double the y-coordinate in (-3, 4), which coordinate would be correct?

A. (-3, 8) B. (-6, 4) C. (-6, 8) D. (-1.5,2) E. None of the above

109. The "product of a number and 10 is 67" is which equation?

A. n/10 = 67 B. n + 10 = 67 C. n – 10 = 67
D. 10n = 67 E. None of the above

110. The sum of the digits in 123,456 is a multiple of which number?

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

111. Fourteen minus some number is half of 10. What is the number?

A. 5 B. 7 C. 8 D. 9 E. None of the above

112. Evaluate: 2(6 – 10)

A. -8 B. 8 C. -2 D. 2 E. None of the above

113. Evaluate: 63 – 2[5 + 3(1 + 7)]

A. 77 B. 62 C. 5 D. 33 E. None of the above

114. Which number if "the quotient of 2 and 4 plus 9" ?

A. 9.5 B. 2/13 C. 8.5 D. 11 E. None of the above

115. Analyze the table of values. Which **expression** gives you the output values?

| Input | Output |
|---|---|
| 2 | 5 |
| 4 | 9 |
| 6 | 13 |
| 8 | 17 |
| 10 | 21 |

A. 2 x (Input) B. 3 x (Input) – 1

C. 4 x (input) – 9 D. 2 x (Input) + 1

E. None of the above

116. Half of a half of 500 is:

A. 200 B. 250 C. 125 D. 100 E. None of the above

117. Evaluate: (30 – 8)/ 2 is three more than which number?

A. 23 B. 8 C. 9 D. 26 E. None of the above

118. Evaluate: 10 ÷ [(8 – 2) + 2(3)]

A. 5/6 B. 8.5 C. 1 D. 3 E. None of the above

119. Evaluate: 19 – [(6 – 4) ÷ 2)]

A. 0 B. 1 C. 19 D. 18 E. None of the above

120. You and three of your friends are going to Sonic to take advantage of their ½ price malts in the evening. The total cost before tax was $11.52. Which expression gives you how much each of you owe?

A. 3 + 11.52 B. 11.52 ÷ 3 C. 11.52 ÷ 4 D. 11.52 ÷ 5
E. None of the above

121. "Six less than a number is 7". Write an equation and find the number.

A. $6 - x = 7$; $x = 1$ B. $x - 6 = 7$; $x = 13$ C. $6x - 6 = 7$; $x = 2$
D. $6 + x = 7$; $x = -1$ E. None of the above

122. Find the expression for the nth term in the table below.

| x | y |
|---|---|
| 1 | 3 |
| 2 | 8 |
| 3 | 13 |
| 4 | 18 |
| n | |

A. $n \div 5$ B. $5n$ C. $5n - 2$

D. $2n \div 5$ E. None of the above

123. Sara had 27 peaches and 11 pears left at her roadside fruit stand. She went to the orchard and picked more peaches to stock up the stand. There are now 83 peaches and 29 pears at the stand, how many of each did she pick?

A. peaches = 55, pears = 18 B. peaches = 54, pears = 19
C. peaches = 56, pears = 17 D. peaches = 56, pears = 18
E. None of the above

124. The sum of 3 different positive whole numbers is 30. The largest number could be:
A. 27 B. 20 C. 28 D. 29 E. None of the above

125. Cailey is ten years older than Tim, and next year Cailey will be twice as old as Tim. How old are they now?

A. 8 and 18 B. 9 and 19 C. 10 and 20 D. 7 and 17
E. None of the above

126. What number comes next in the sequence: 1, 1, 2, 3, 5, 8, ___

A. 10 B. 11 C. 13 D. 12 E. None of the above

127. The difference between the 2 consecutive prime numbers can NEVER be __

A. 1 B. 2 C. 3 D. 5 E. None of the above

128. The ratio of black bears to grizzly bears in a national park is 3:1. IF there are 24 black bears, how many grizzly bears would there be?

A. 6 B. 7 C. 8 D. 12 E. None of the above

129. Evaluate: $7 - |4| + 2$

A. 13 B. 14 C. 6 D. 5 E. None of the above

130. What is the $10^{th}$ term in the table?

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ½ | 1 | 2 | 4 | 8 | | | | | ? |

A. 512 B. 64 C. 256 D. 128 E. None of the above

131. Find the y values in the table using the equation: $y = 3x - 1$

| **x** | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| **y** | | | | | |

A. 0, 3, 6, 9, 12 B. -3, 4, 11, 18, 25 C. -1, 2, 5, 8, 11
D. 0, 4, 8, 12, 15 E. None of the above

**#132-134: Write the expressions.**

132. "Twice the difference of a number x and 3"

A. 3x + 3 B. 4(x – 3) C. 2(3) - x
D. 2(x – 3) E. None of the above

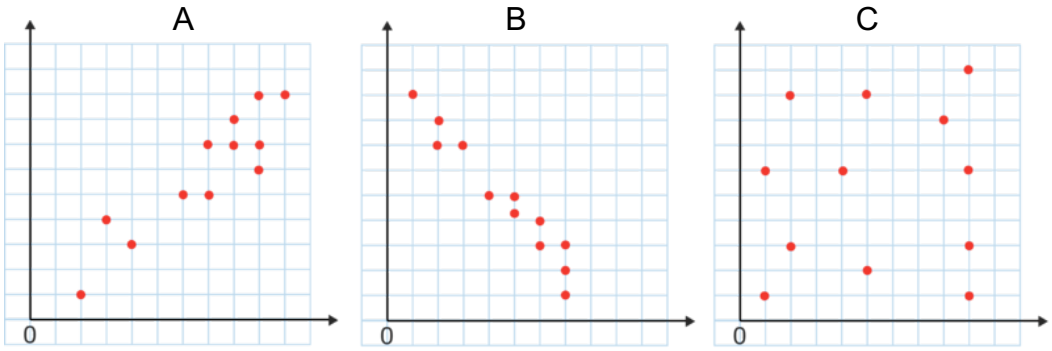
133. "Seven times a number squared"

A. 7(2x) B. $7x^2$ C. 7(x + 2) D. 7x E. None of the above

134. The **product of two consecutive odd integers**, such as 3 x 5 or 5 x 7.

A. (n)(n + 1) B. (n)(n + 2) C. n x n
D. n x 2n E. None of the above

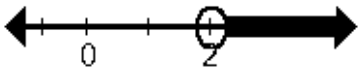
135. Which of the following graphs shows a **no correlation**?




E. None of the above

136. Which graph shows the inequality: **x < 2** ?

A. 


B. 


C. 


D. 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**#137-140 Solve for x.**

137. 1.3x = 52

A. 40 B. 4 C. 50.7 D. 53.3 E. None of the above

138. 6x + 5 < 8

A. x > 13 B. x < 3 C. x > 2 D. x < 0.5 E. None of the above

139. 2x – 5 = x + 11

A. 8 B. 11 C. 16 D. 3 E. None of the above

140. ½ x + 1 = 3

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