Kansas City Area Teachers of Mathematics
2016 KCATM Math Competition

STATISTICS and PROBABILITY GRADE 6

<u>INSTRUCTIONS</u>

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

- Time limit: **20 minutes**

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

- 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.

- Choice **E** can be a valid answer. It will indicate that the answer is "None of the above."

Student Name _____ Student Number _____

School _____

101. Six candidates place their names in a hat. Two are Democrats. Four are Republicans. One name is randomly drawn from the hat. **What is the probability of _not_ selecting a Republican?**

  A. 1/4 B. 1/6 C. 1/2 D. 1/3 E. None of the above

102. A regular six-sided die is tossed. **What is the probability of getting a factor of 24?**

  A. 1/6 B. 1/3 C. 2/3 D. 80% E. None of the above

103. A number is chosen randomly between 1 and 10. **What is the probability of selecting a multiple of 3 or a multiple of 4?**

  A. 20% B. 30% C. 50% D. 60% E. None of the above

104. Five times a quarter is flipped. Heads is up each time. **What is the probability that heads will be up when it is flipped the sixth time?**

  A. 1/6 B. 1/3 C. 1/2 D. 83.3% E. None of the above

During an experiment 4 coins were tossed once. Use this to answer questions #105-107.

105. How many outcomes will be in the sample space for this experiment?

  A. 4 B. 8 C. 12 D. 16 E. None of the above

106. What is the probability of tossing either 4 heads _or_ 4 tails?

  A. 1/16 B. 1/8 C. 1/2 D. 100% E. None of the above

107. A math class has 24 students. Each student tosses three coins once. How many students would you expect to toss at least 2 heads?

  A. 8 B. 9 C. 12 D. 24 E. None of the above

Use the temperature data for Kansas City for problems #108-110.
From February 14–23, 2016 the high temperature in Kansas City was:
52°, 55°, 48°, 63°, 76°, 72°, 74°, 56°, 51° and 52°

108. To the nearest tenth of a degree, what is the **mean** of this data?

    A. 56.2   B. 58.8   C. 59.9   D. 62.5   E. None of the above

109. What is the **median** of this data?

    A. 76   B. 72   C. 55   D. 55.5   E. None of the above

110. What is the **interquartile range** for this data?

    A. 20   B. 52   C. 70   D. 11   E. None of the above

111. You were calculating your grade before your last test of the quarter. Your first 4 tests were: 76%, 82%, 68%, and 92%. What **minimum test score** would you need on your 5th test if you want an **average of at least 80%**?

    A. 88%   B. 85%   C. 82%   D. 91%   E. None of the above

A bag contains 4 red marbles, 5 green marbles, and 3 blue marbles. Use this information to answer problems #112-115.

112. A marble is drawn, **replaced** and then a second marble is drawn. **What is the probability that a blue marble is drawn and then a red marble is drawn?**

    A. 5/8   B. 1/4   C. 1/12   D. 7/144   E. None of the above

113. A marble is drawn and **NOT replaced**. Then a second marble is drawn. **What is the probability that both marbles are blue?**

    A. 3/72   B. 5/12   C. 1/22   D. 6/24   E. None of the above

114. A marble is drawn and **NOT replaced**. Then a second marble is drawn. **What is the probability that the first marble drawn is red and the second is green?**

    A. 10/72   B. 5/36   C. 1/22   D. 5/33   E. None of the above

115. A marble is drawn and **NOT replaced**. Then a second marble is drawn. **What is the probability the first marble drawn is NOT green, and the second marble is green?**

    A. 12/23   B. 35/132   C. 12/132   D. 12/144   E. None of the above

For problems #116-118, use the line graph of Caitlin's Height from Birth to age 8.
https://www.pinterest.com/pin/20618110763901812/
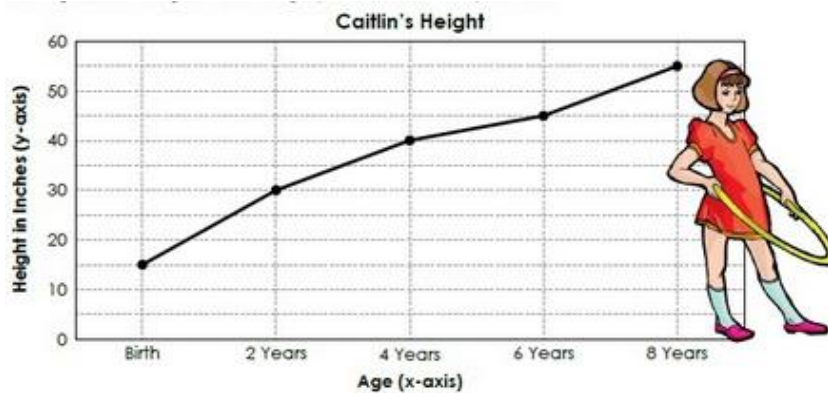
**116**. Between which two years did the **least amount** of growth take place?

   A. Birth-2   B. 2-4   C. 4-6   D. 6-8   E. None of the above

117. Reading the graph, what would be Caitlin's **approximate height** at age 1?

   A. 15 in.   B. 22.5 in.   C. 19 in.   D. 28 in.   E. None of the above

118. Use the graph to **estimate** what Caitlin's height might be at age 9.

   A. 45 in.   B. 50 in.   C. 55 in.   D. 60 in.   E. None of the above

Use the survey results for the number of people using technology to do research in the table below for problems 119-120.
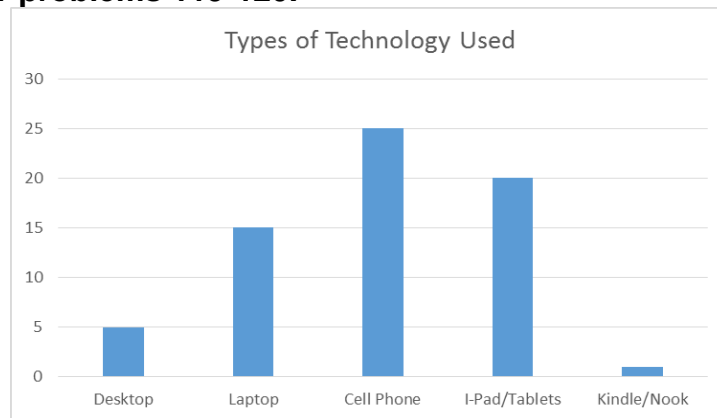
119. How many people used **laptops, cell phones, or I-Pads/Tablets**?

   A. 50   B. 66   C. 65   D. 60   E. None of the above

120. **How many more people** use laptops or I-Pads/tablets compared to cell phones?

   A. 5   B. 10   C. 15   D. 20   E. Not given

Use the Venn Diagram that shows sports played by students taking a survey. Use for problems #121-123. https://www.pinterest.com/pin/92605336061236713/
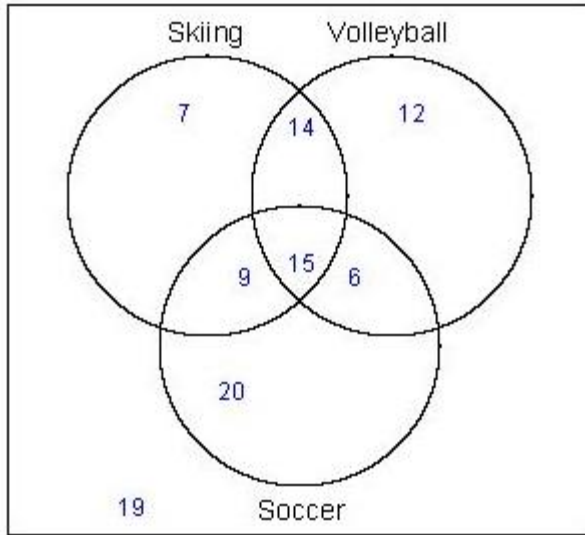
121. How many people were surveyed?

    A. 68   B. 83   C. 100
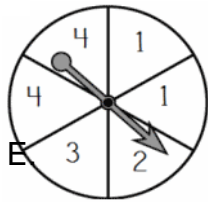   D. 102   E. None of the above

122. How many people had **exactly** two sports?

    A. 14   B. 29   C. 30
    D. 44   E. None of the above

123. How many people did **not** ski, play volleyball, or play soccer?

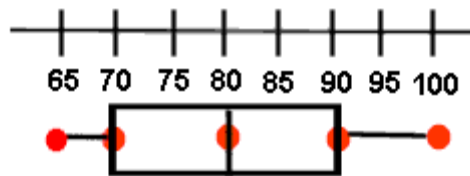   A. 0   B. 20   C. 19
    D. 15   E. None of the above

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124. What is the probability of landing on a **factor** of 12?

    A. 2/3   B. 1/2   C. 5/6
    D. 1   E. None of the above

Use the following box plot on test scores to answer the problems #125-127.
http://www.regentsprep.org/regents/math/algebra/multiplechoicereview/workingdata.htm

125. What is the **range** of test scores?

    A. 35   B. 20   C. 45   D. 65   E. None of the above

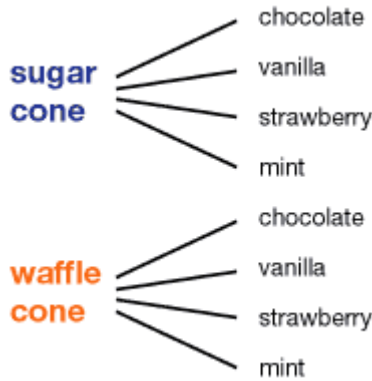**126**. **Fifty percent of the students scored between which 2 scores?**

    A. 65 and 70   B. 70 and 80   C. 80 and 90
    D. 70 and 90   E. None of the above

127. **Eighty percent represents which data term?**

    A. mean   B. median   C. mode   D. range   E. None of the above

**Use the tree diagram for combinations of ice cream cones to find the information in problems #128-130.**

sugar cone: chocolate, vanilla, strawberry, mint

waffle cone: chocolate, vanilla, strawberry, mint

128. **How many different ways** can you select a cone with one scoop of ice cream?
    A. 4   B. 6   C. 8   D. 10   E. None of the above

129. What is the probability of choosing vanilla or chocolate?
    A. 1/2   B. 1/3   C. 1/4   D. 1/8
    E. None of the above

130. What is the probability of choosing a waffle cone with strawberry ice cream?
    A. 1/2   B. 1/3   C. 1/4   D. 1/8
    E. None of the above

131. Use the data from the pie graph **to determine the number of people in school who like <u>country or rock music</u> if there are 500 people in the school.**

    A. 300   B. 175   C. 350   D. 125   E. None of the above

Classical 10%, Alternative 15%, Rock 35%, Country 25%, Jazz 15%
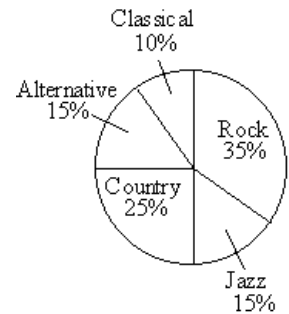
132. The circle graph below shows the degree of the central angle that shows how many students take the bus, walk, bike, or get transported to school by car. **Determine the percent of students that take the <u>bus</u> to school.**

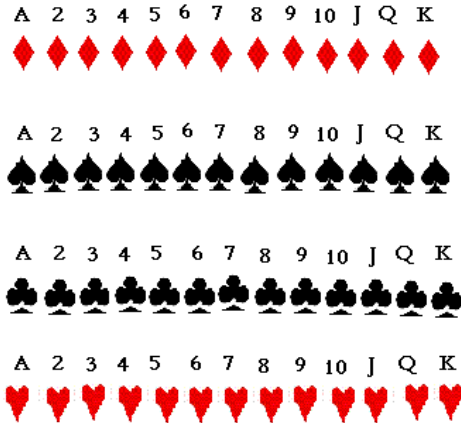Bus 144°, Walk 108°, Car 72°, Bike 36°
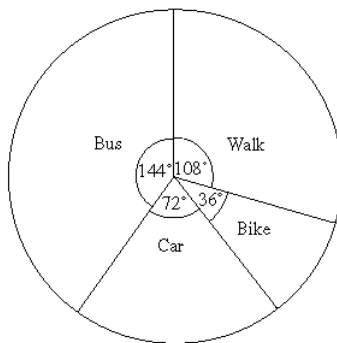
    A. 20%   B. 40%   C. 60%   D. 80%   E. None of the above

133. Use the bag of marbles to determine the **probability of selecting a solid colored marble.**

    A. 0.3   B. 0.4   C. 0.6   D. 0.25   E. None of the above

Use the standard deck of cards shown to answer problems #134-136.

www.analyzemath.com

134. How many cards are in a standard deck (see figure)?

     A.   13   B. 26   C. 50
     D.   52   E. None of the above

135. What is the probability of getting **a Jack, a Queen, or a King** out of the deck of cards?

     A.   0.23   B. 0.10   C. 0.16
     D.   0.06   E. None of the above

136. What is the probability of getting an **Ace of Diamonds?**
     A.   1/13   B. 1/12   C. 1/48
     D.   1/50   E. None of the above

Use the table showing possible sums resulting from rolling two dice to answer problems #137-140.

137. What is the probability of getting a **sum of less than 7**?

     A. 7/12   B. 5/12   C. 23/36   D. 1/2
     E. None of the above

138. What is the probability of getting an **odd sum that is greater than or equal to 7**?

     A. 8/15   B. 1/2   C. 4/9   D. 1/3
     E. None of the above

139. What is the probability of getting a **multiple of four**?

     A. 5/18   B. 1/3   C. 1/2   D. 1/4   E. None of the above

140. What is the probability of getting a **factor of 12**?

     A. 5/18   B. 1/3   C. 1/2   D. 1/4   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	C	●	E	121.	A	B	C	●	E
102.	A	B	C	D	●	122.	A	●	C	D	E
103.	A	B	●	D	E	123.	A	B	●	D	E
104.	A	B	●	D	E	124.	A	B	C	●	E
105.	A	B	C	●	E	125.	●	B	C	D	E
106.	A	●	C	D	E	126.	A	B	C	●	E
107.	A	B	●	D	E	127.	A	●	C	D	E
108.	A	B	●	D	E	128.	A	B	●	D	E
109.	A	B	C	●	E	129.	●	B	C	D	E
110.	●	B	C	D	E	130.	A	B	C	●	E
111.	A	B	●	D	E	131.	●	B	C	D	E
112.	A	B	●	D	E	132.	A	●	C	D	E
113.	A	B	●	D	E	133.	A	B	●	D	E
114.	A	B	C	●	E	134.	A	B	C	●	E
115.	A	●	C	D	E	135.	●	B	C	D	E
116.	A	B	●	D	E	136.	A	B	C	D	●
117.	A	●	C	D	E	137.	A	●	C	D	E
118.	A	B	C	●	E	138.	A	B	C	●	E
119.	A	B	C	●	E	139.	A	B	C	●	E
120.	A	●	C	D	E	140.	A	●	C	D	E