

Kansas City Area Teachers of Mathematics
2014 KCATM Math Competition

STATISTICS and PROBABILITY
GRADE 7

INSTRUCTIONS

- **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** is a valid answer. It will be either “None of the above” or “All are true.”

Student Name _____ Student Number _____

School _____

101. What is the probability of getting a factor of 6 when you toss a regular 6-sided die?
 A. $\frac{5}{6}$ B. $\frac{1}{2}$ C. $\frac{1}{3}$ D. $\frac{2}{3}$ E. None of the above
102. A number is chosen at random from 1 to 10. What is the probability of selecting a multiple of 3?
 A. 30% B. 20% C. 3% D. 10% E. None of the above
103. A number is chosen at random from 1 to 10. What is the probability of selecting a multiple of 2 or a multiple of 3?
 A. 50% B. 30% C. 80% D. 70% E. None of the above
104. Marlene flipped a nickel four times, and each time, the coin landed on heads. What is the probability of the nickel landing on tails the fifth time?
 A. 0.4 B. 0.5 C. 0.2 D. 0.8 E. None of the above

Use this experiment to answer questions 105-107. During an experiment, three coins were tossed ten times. The results were:

HHH	HTT	THT	THH	HHT
HTH	HTT	TTT	HHT	HHH

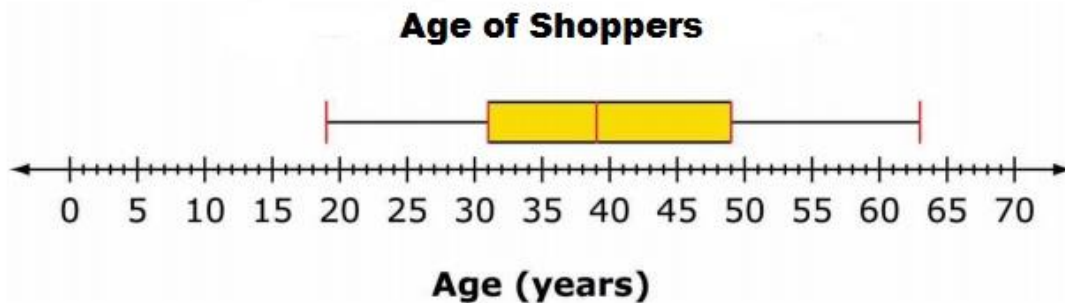
105. Using the experiment, what was the probability of tossing two heads and one tail?
 A. 0.3 B. 0.4 C. 0.5 D. 0.6 E. None of the above
106. What was the probability of tossing 3 heads or 3 tails?
 A. $\frac{1}{2}$ B. $\frac{1}{5}$ C. $\frac{3}{10}$ D. $\frac{1}{4}$ E. None of the above
107. A math class has 25 students. Based on this data, how many students would you expect to toss at least 2 heads?
 A. 15 B. 16 C. 10 D. 13 E. None of the above

The list below shows the high temperature on 15 consecutive days in Kansas City. Use this data to answer problems 108 – 111.

56°, 62°, 65°, 51°, 56°, 54°, 68°, 69°, 72°, 74°, 68°, 65°, 65°, 62°, 60°

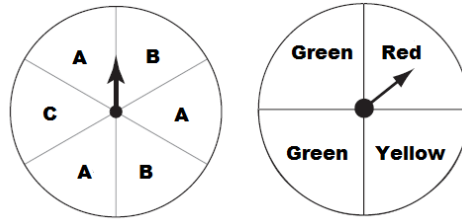
108. To the nearest tenth of a degree, what is the **mean** of this data?
 A. 65.0° B. 61.3° C. 64.6 D. 63.1° E. None of the above
109. What is the median of this data?
 A. 61.3° B. 65° C. 72° D. 63.5° E. None of the above
110. What is the mode of this data?
 A. 61.3° B. 65° C. 72° D. 63.5° E. None of the above
111. What is the range for this data?
 A. 65° B. 124° C. 23° D. 12° E. None of the above

Use the box plot below that shows the ages of 48 shoppers at a local store to answer questions 112 – 116.



112. Which of the following **can** be determined from looking at the box plot?
- A. mode, mean B. mean, median C. range, median
D. mode, range E. All of the above
113. What is the **interquartile range** of the data?
- A. 31 B. 113 C. 39 D. 49 E. None of the above
114. What is the **median** of the data?
- A. 39 B. 19 C. 31 D. 49 E. None of the above
115. How many shoppers are between the ages of 31 and 39?
- A. 44 B. 11 C. 12 D. 40 E. None of the above
116. **Using the information on the box plot**, which of the following is **NOT** true about this set of data?
- A. The median of the data is 39.
B. There are more shoppers older than 39 than there are shoppers younger than 39.
C. Three-fourths of the shoppers are at least 31 years old.
D. The range of the ages is 44.
E. All are true.

Use the spinners shown below to answer questions 117 – 120.



117. If each spinner is spun once, how many different outcomes are in the sample space?
A. 9 B. 24 C. 10 D. 32 E. None of the above
118. What is the probability of spinning an “A” on the first spinner and “green” on the second?
A. $1/2$ B. $3/8$ C. $1/4$ D. $1/3$ E. None of the above
119. A trial consists of spinning both spinners once. If 48 trials are conducted, how many times would you expect to get the outcome (A, Yellow)?
A. 12 B. 6 C. 9 D. 8 E. None of the above
120. A trial consists of spinning each spinner once. If 48 trials are conducted, how many times would you expect to get the outcome (C, Green)?
A. 8 B. 6 C. 4 D. 12 E. None of the above

A local restaurant is offering a special on a steak dinner. The numbers of steak dinners sold over a 10 day period are shown below. Use this data to answer questions 121 – 122.

20, 32, 35, 40, 25, 45, 50, 55, 57, 31

121. Which of the following statements is **true**?
- A. The mean of the data is 39.
 - B. The median of the data is 37.5.
 - C. There is no mode.
 - D. The range of the data is 37.
 - E. All statements are true.
122. Which statistic would **NOT** change if you added another 25 to the data set?
- A. range B. mean C. median D. mode E. None of the above

123. Two seventh grade science classes took a test. There are 25 students in each class. The mean score in each class was 85%. The mean absolute deviation (MAD) of the scores in Class A was 5.6. The mean absolute deviation (MAD) of the scores in Class B was 9.6. Which of the following statements **MUST** be true?

- A. There is more variability in the scores in Class A because the MAD shows a greater spread of data in A was greater than B.
- B. There is more variability in the scores in Class B because the MAD shows the spread of data in B was greater than A.
- C. The mean score in Class A will be higher than the mean score in Class B.
- D. The mean score in Class B will be higher than the mean score in Class A.
- E. None of the statements MUST be true.

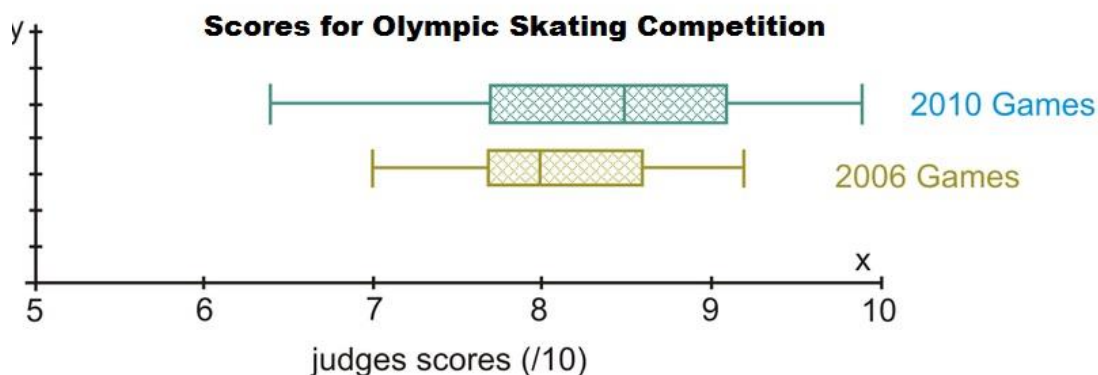
124. The mean of a data set is 12 and its range is 8. Which of the following values could **NOT** be a value in the set?

- A. 6
- B. 8
- C. 12
- D. 16.
- E. None of the above

125 Which of the following questions is NOT statistical?

- A. What are the heights of the students in my math class?
- B. How old is my dog?
- C. What types of pizza do my friends like?
- D. How many letters are in the names of the towns in Missouri?
- E. None of the above.

Use the box plots shown below to answer questions 126 – 127.



126. What is the median score awarded at the 2010 games?

- A. 7.8
- B. 8
- C. 8.5
- D. 9
- E. None of the above

127. What percent of the scores awarded at the 2006 games were below 8?

- A. 20%
- B. 25%
- C. 40%
- D. 50%
- E. None of the above

A bag contains 5 red marbles, 4 green marbles, and 3 blue marbles. Use this information to answer questions 128 – 131.

128. A marble is drawn, **replaced**, and then a second marble is drawn. What is the probability that both marbles are red?

- A. $5/12$ B. $10/12$ C. $25/12$ D. $25/144$ E. None of the above

129. 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. $5/12$ B. $5/48$ C. $9/12$ D. $2/3$ E. None of the above

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

- A. $5/33$ B. $25/144$ C. $25/33$ D. $10/144$ E. None of the above

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

- A. $1/11$ B. $5/44$ C. $15/144$ D. $9/144$ E. None of the above

Use the frequency table for questions 132 – 134. The frequency table shows the results of a survey of 6th graders who were asked the number of minutes they spent on homework the evening before.

Minutes of Homework	Tally	Frequency
20 - 29		5
30 - 39		8
40 - 49		9
50 - 59		10
60 - 69		6
70 - 79		2

132. How many students were surveyed?

- A. 6 B. 26 C. 40 D. 44 E. None of the above

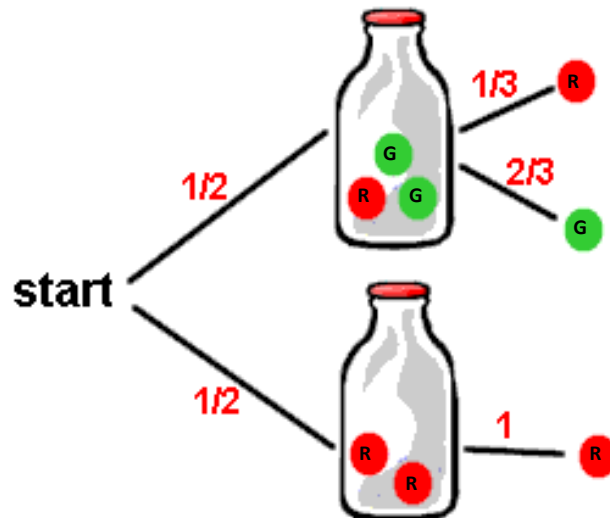
133. Which of the following statements is **NOT** true?

- A. The median of the data will be between 40 and 49 minutes.
- B. The number of students who reported doing at least 60 minutes of homework is equal to the number who had between 30 and 39 minutes.
- C. The majority of students reported doing fewer than 50 minutes of homework.
- D. No students reported doing fewer than 20 minutes of homework.
- E. None of the statements are false.

134. What is the probability a student will have between 60 and 70 minutes of homework?

- A. $6/7$ B. $1/2$ C. 1 D. $3/20$ E. None of the above

There are two identical bottles. One bottle contains 2 green balls and 1 red ball. The other contains 2 red balls. A bottle is selected at random and a single ball is drawn. Use the tree diagram shown to answer questions. 135 – 137.



<http://www.regentsprep.org/regents/math/algebra/apr4/practre.htm>

135. What is the combined probability that the top bottle will be chosen and a green ball will be drawn from that bottle?

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

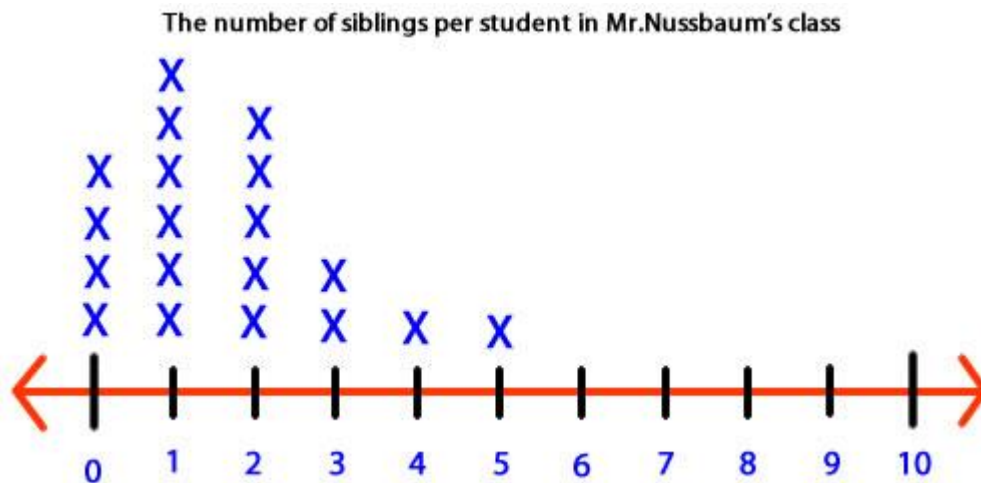
136. What is the probability the bottom bottle will be chosen and a green ball will be drawn from that bottle?

- A. 1 B. $1/2$ C. $1/3$ D. 0 E. None of the above

137. What is the **combined probability** that a red ball is chosen when the bottle selected is not known?

- A. $1/12$ B. $1/6$ C. $1/3$ D. $2/3$ E. None of the above

The line plot below shows the number of siblings of the students in a 6th grade class. Use the line plot to answer questions 138-140.



138. **How many** students were surveyed?

- A. 6 B. 19 C. 20 D. 24 E. None of the above

139. What is the **median** number of siblings?

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

140. What is the **mode** of the data?

- A. 0 B. 3 C. 1 D. 2 E. None of the above

Shade the correct answer!

Example: A ● C D E

Name _____

School _____

- 101. A B C D E
- 102. A B C D E
- 103. A B C D E
- 104. A B C D E
- 105. A B C D E
- 106. A B C D E
- 107. A B C D E
- 108. A B C D E
- 109. A B C D E
- 110. A B C D E
- 111. A B C D E
- 112. A B C D E
- 113. A B C D E
- 114. A B C D E
- 115. A B C D E
- 116. A B C D E
- 117. A B C D E
- 118. A B C D E
- 119. A B C D E
- 120. A B C D E

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

- 121. A B C D ●
- 122. ● B C D E
- 123. A ● C D E
- 124. A B C D ●
- 125. A ● C D E
- 126. A B ● D E
- 127. A B C ● E
- 128. A B C ● E
- 129. A ● C D E
- 130. ● B C D E
- 131. A ● C D E
- 132. A B ● D E
- 133. A B C D ●
- 134. A B C ● E
- 135. A B ● D E
- 136. A B C ● E
- 137. A B C ● E
- 138. A ● C D E
- 139. ● B C D E
- 140. A B ● D E