

Kansas City Area Teachers of Mathematics
2017 KCATM Math Competition

STATISTICS and PROBABILITY

GRADE 8

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

Student Name _____ Student Number _____

School _____

101. There are six sides to a standard die, numbered 1-6. **What is the probability of NOT getting a factor of 6?**

- A. $\frac{1}{4}$ B. $\frac{1}{6}$ C. $\frac{1}{2}$ D. $\frac{1}{3}$ E. None of the above

102. A standard deck of cards has 52 cards with 4 suits: clubs, hearts, spades, and diamonds. **What is the probability of getting a heart?**

- A. $\frac{1}{52}$ B. $\frac{1}{13}$ C. $\frac{4}{13}$ D. $\frac{1}{4}$ E. None of the above

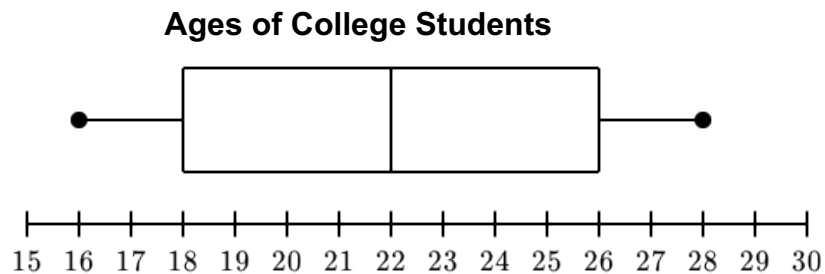
103. A number is chosen randomly between 1 and 100. **What is the probability of selecting an even number?**

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

104. The three primary colors are equally represented on a spinner. **What is the probability that you will spin a purple?**

- A. $\frac{1}{3}$ B. 0 C. 1 D. $\frac{1}{2}$ E. None of the above

#105-107: Use the box plot (box and whiskers).



105. What is the **range** of ages at the college?

- A. 16 B. 18 C. 28 D. 22 E. None of the above

106. **Twenty-five percent** of the problems are between which 2 ages?

- A. 16-22 B. 18-26 C. 16-28 D. 26-28 E. None of the above

107. What is the **median** age of the students at this college?

- A. 16 B. 18 C. 22 D. 26 E. None of the above

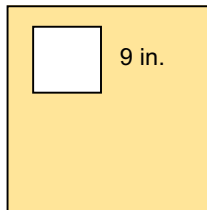
108. Cheyenne recorded the number of cups of water she drank each day for 7 days. The median daily number of cups of water she drank was 6. The range of the number of cups of water she drank was 4. Which statement can be made from the given information?

- A. At least one day, she drank exactly 6 cups of water.
- B. The least amount of water she drank could have been 1 cup.
- C. The mean daily number of cups of water she drank is greater than the median daily number of cups of water.
- D. If the least amount of water she drank was 3 cups, then the greatest amount of water she drank was 9 cups.
- E. None of the above

109. If you select a vowel out of the first 10 letters in the alphabet, what would be its probability?

- A. 0.10
- B. 0.20
- C. 0.30
- D. 0.1923
- E. None of the above

110. You are tossing a bean bag on the following square with a square surface. What would the **probability be of landing on the small square**? Round to the nearest tenth of a percent.



2 ft.

- A. 14.1%
- B. 44.4%
- C. 22.2%
- D. 37.5%
- E. None of the above

#111-113: Use the spinner to determine the probability.



111. What is the probability of landing on a 3 twice in a row?

- A. $1/6$
- B. $1/9$
- C. $1/4$
- D. $1/36$
- E. None of the above

112. What is the probability of landing on a 1 or a 4?

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

113. What is the probability of landing on a factor of 8?

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

#114-116: Use the frequency table on the number volunteer hours students performed for one week.

Volunteering

Number of Hours	Students
1	
2	
3	
4	
5	
6	

114. What is the total number of hours the students volunteered that week?
- A. 21 B. 20 C. 65 D. 38 E. None of the above
115. What is the median number of hours the students volunteered that week?
- A. 2 B. 2.5 C. 3 D. 3.5 E. None of the above
116. What is the mean number of hours the student the students volunteered that week?
- A. 2.75 B. 3 C. 3.25 D. 3.5 E. None of the above
-

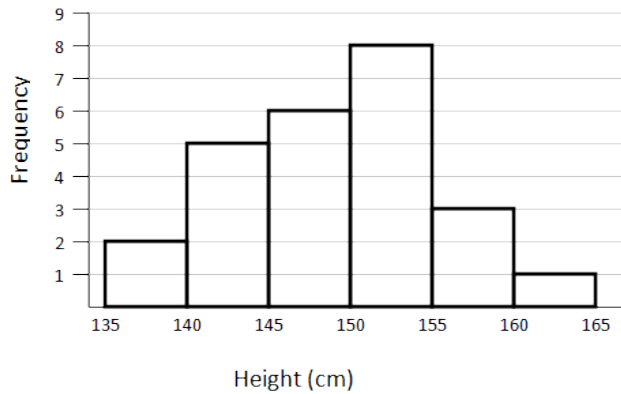
117. What is the probability the you would select a day of the week that begins with the letter "T" ? Round your answer to the nearest thousandth.

- A. 0.143 B. 0.286 C. 0.429 D. 0.571 E. None of the above

118. You want to put an outfit together from 3 pair of jeans, 2 pair of shoes, and 4 shirts. How many different outfits can you put together?

- A. 9 B. 20 C. 24 D. 18 E. None of the above

#119-121: Use the graph on the height of high school students in this study.
Height of Students



119. What is the **range** of heights measured on this graph?
- A. 135 cm B. 30 cm C. 150 cm D. 165 cm E. None of the above
120. How many students were in this study?
- A. 25 B. 20 C. 50 D. 8 E. None of the above
121. What was the **mode** of heights of the students in this study?
- A. 140-150 B. 150-155 C. 160-165 D. 135-140 E. None of the above

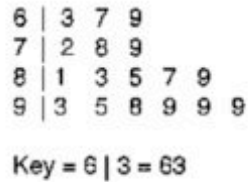
#122-124: The following data came from an experiment on the number of goals made in a soccer game during the season.

3	4	1	4
1	1	2	1

122. Based on the data, estimate the probability that the next game will have one goal scored.
- A. 0.25 B. 0.125 C. 0.50 D. 0.625 E. None of the above
123. Based on the data, what is the probability that fewer than 4 goals will be scored?
- A. 0.25 B. 0.75 C. 0.50 D. 0.625 E. None of the above
124. Based on the data, what is the probability that no goals will be scored?
- A. 0.25 B. 0.125 C. 0.50 D. 0.625 E. None of the above

#125-128: The following stem and leaf plot shows the data as a list of Jacob’s percent scores on quizzes for this semester.

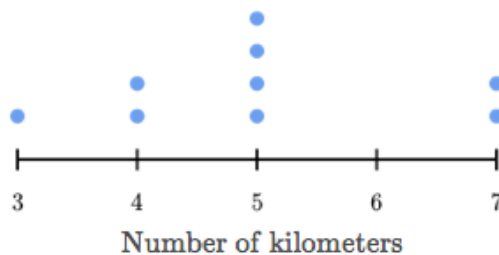
Jacob’s Quiz Scores



125. How many quiz grades has Jacob had?
- A. 15 B. 17 C. 19 D. 20 E. None of the above
126. What was the **range** of Jacob’s scores?
- A. 99 B. 32 C. 63 D. 36 E. None of the above
127. What was the **median** score for Jacob?
- A. 86 B. 87 C. 85 D. 81 E. None of the above
128. What was Jacob’s **mean** score to the nearest tenth of a percent?
- A. 84.3% B. 84.5% C. 85.4% D. 85.5% E. None of the above

129. Each dot on the following data plot shows the number of kilometers run during a tennis match by a player. Each dot is one game.

Exercise During Tennis Matches



- Which conclusion can you **NOT** draw from the data?
- A. A total of 45 km was run during the tennis matches in the data.
- B. The mode was 5 kilometers of running during a tennis match.
- C. The probability of running at least 5 km during a match is 70%.
- D. The probability of running only 3 km during a match is 11.1%.
- E. None of the above

130. If you tossed a quarter 82 times, what would you expect to be the number of heads tossed?

- A. 34 B. 37 C. 41 D. 43 E. None of the above

131. The Fundamental Counting Principle allows you to multiply your choices in finding the sample set. Use it to show how you would find how many ways could you arrange 5 books on the shelf. Which way shows the Fundamental Counting Principle?

- A. 5×5 B. $5 \times 4 \times 3 \times 2 \times 1$ C. 5×1 D. 5×4 E. None of the above

132. If you have 5 people in your group and only 2 are needed to make the team's presentation, how many different way can 2 people be chosen? (Hint: Fund. Counting Prin.)

- A. $5 \times 5 = 25$ B. $5 \times 4 \times 3 \times 2 \times 1 = 120$ C. $5 \times 1 = 5$
D. $5 \times 4 = 20$ E. None of the above

133. You were calculating your grade before your last test of the quarter. Your first 3 tests were: 90%, 88%, and 78%. What **minimum test score** would you need on your 4th test if you want an **average of exactly 85%**?

- A. 86% B. 85% C. 84% D. 83% E. None of the above
-

#134-137: A bag contains 10 red (r) marbles, 15 yellow (y) marbles, and 5 blue (b) marbles.

134. What is the probability that a red marble, P(r), is drawn from the bag?

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

135. A marble is drawn and replaced and then a second marble is drawn. What is the P(r) **and** P(b)?

- A. $5/18$ B. $1/18$ C. $1/30$ D. $1/2$ E. None of the above

136. A marble is drawn and not replaced and then a second marble is drawn. What is the P(r) **and** P(r)? Round to the nearest hundredth.

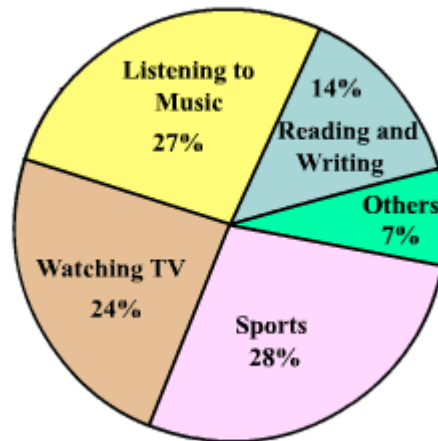
- A. 0.10 B. 0.06 C. 0.11 D. 0.09 E. None of the above

137. What is the probability that you will get a red or a yellow marble drawn from the bag? Round to the nearest tenth of a percent.

- A. 50.0% B. 100.0% C. 71.4% D. 83.3% E. None of the above

#138-140: Use the pie graph on the leisure time spent by students.

How students spend their free time



138. If there are 150 students in your grade level, what would the data show as the number who would spend their time **reading** during their free time?

- A. 21 B. 41 C. 36 D. 14 E. None of the above

139. If there are 150 students in your grade level, what would the data show as the number who **watched TV or listened to music** during their free time?

- A. 51 B. 78 C. 83 D. 77 E. None of the above

140. If there are 150 students in your grade level, what would the data show as the number who **use their cell phones** during their free time?

- A. 21 B. 41 C. 36 D. 42 E. None of the above