Kansas City Area Teachers of Mathematics
2018 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 if it states **None of the Above and the other answers are not correct.**

Student Name _____ Student Number _____

School _____

Use the survey below for # 101-106.
A survey published in the school newspaper asked students who were 13, 14, and 15 years old about their exercise habits. There were 600 responses. The table shows the numbers of students who responded they exercise 2 hours or more each week.

	13 years	**14 years**	**15 years**
Female	52	57	51
Male	65	68	67

101. Find the **difference in ranges** from the girls to the boys.

A. The ranges are the same.
B. The boys' range is 2 greater than the girls' range.
C. The girls' range is 2 greater than the boys' range.
D. The boys' range is 3 greater than the girls' range.
E. The girls' range is 3 greater than the boys' range.

102. Find the **ratio of differences in ranges** from the girls to the boys.

A. The ratio is 1:2.
B. The ratio is 1:1.
C. The ratio is 2:1.
D. The ratios is 3:1
E. None of the above

103. Based on this data, what is the **probability that a randomly selected student who participated in the survey exercises 2 hours or more each week?**

A. 0 B. 1:3 C. 3:5 D. 5:3 E. 3:1

104. Based on this data what is the **median** amount of these students who exercises two or more hours each week?
A. 52 B. 57 C. 61 D. 67 E. None of the above

105. Which conclusion can you **NOT** draw based on the data in the graph?

A. Boys are generally better at exercising than girls.
B. Girls are generally better at exercising than boys.
C. Boys are better at responding to surveys than girls.
D. Girls are better at responding to surveys than boys.
E. None of the above

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106. Six colored blocks are placed in a sack. Two are primary colors. Four are secondary colors. One block is randomly drawn from the sack. **What is the probability of not** selecting a primary color**?**

A. 0 B.1/6 C. 1/3 D. 1/2 E. 2/3

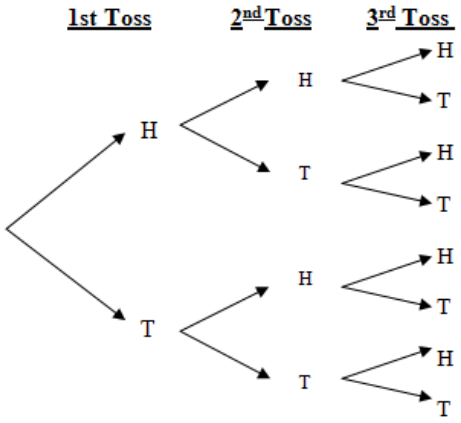
107. What is the probability of rolling a sum of five when there are two die**?**

A. 1/9 B. 1/6 C. 1/5 D. 1/3 E. None of the above

108. A regular six-sided die is tossed. **What is the probability of rolling a prime factor of 100?**

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

For problems #109-111, three fair coins are flipped.



109. What is the total number of possible outcomes for the three flips?

A. 1 B. 3 C. 6 D. 8 E. 9

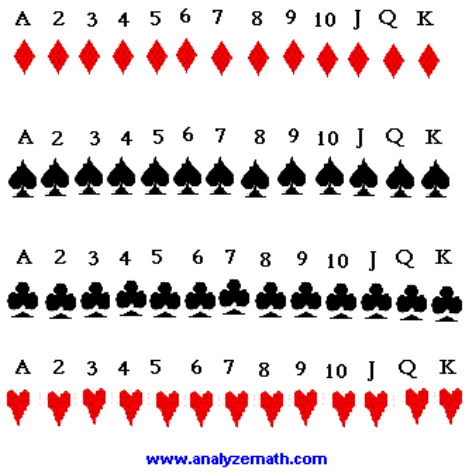
110. What is the probability that **two are heads and one is a tail**?

A. 1/8 B. 3/8 C. 1/2 D. 5/8 E. None of the above

111. What is the probability that **NONE of the coins are heads**?

A. 7/8 B. 5/8 C. 1/2 D. 3/8 E. 1/8

Use the standard deck of cards shown to answer problems #112-115.



112. How many cards are in a standard deck ?

A. 4 B. 13 C. 50
D. 52 E. None of the above

113. What is the probability of getting f**ace card** out of the deck of cards?

A. 0.06 B. 0.10 C. 0.13
D. 0.23 E. None of the above

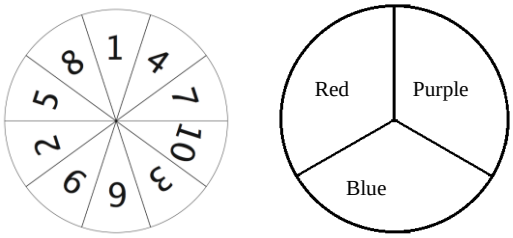
114. What is the probability of getting an Jack **of Diamonds or an Ace of Hearts?**

A. 1/52 B. 2/51 C.1/26
D. 1/13 E. None of the above

115. What is the probability of getting an **even red numbered card?**

A. 0.192 B. 0.231 C. 0.385
D. 0.432 E. None of the above

Use the two spinners below to answer problems #116 –118.



116. If the color spinner is spun, what is the probability of landing on a primary color?

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

117. If the number spinner is spun, what is the probability that a number is a multiple of 3?

A. 10% B. 33 1/3 % C. 40% D. 50% E. None of the above

118. When spinning both spinners, what is the probability that you will spin a 3 and Purple?

A. 1/10 B. 1/15 C. 1/30 D. 2/13 E. None of the above

Use the data in the table on Selected Champion Trees for problems #119-121.

Selected Champion Trees

Tree Type	Circumference (ft)	Height (ft)	Spread/Diameter (ft)
Giant Sequoia (Calif.)	83.2	275	107
Coast Redwood (Calif.)	79.2	321	80
Swamp Chestnut Oak (Tenn.)	23.0	105	216
Florida Crossopetalum (Fla.)	0.4	11	3
White Oak (Md.)	31.8	96	119

SOURCE: *Washington Post*

119. What is the **median spread/diameter** in feet of the trees listed?

A. 216 B. 213 C. 119 D. 107 E. None of the above

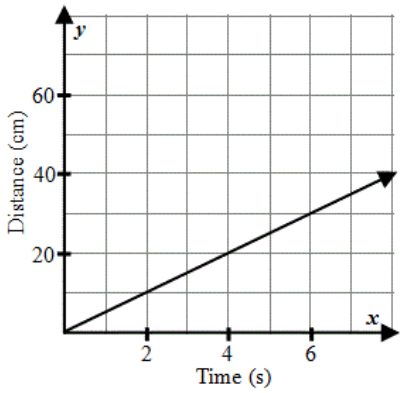
120. What is the **mean circumference** of the Champion Trees?

a. 31.8 B. 96 C. 161.8 D. 310 E. None of the above

121. What is the **difference in the heights** between the two California trees?

A. .4 ft. B. 1 ft. C. 4 ft. E. 5 ft. E. 82.8 ft

Use the graph on the distance an ant travels over time for problems #122-123.



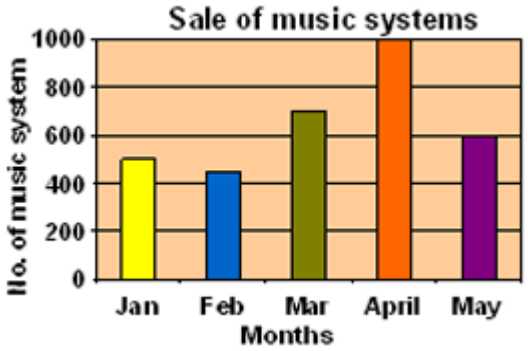
122. What is the **rate** at which the ant travels in the first three seconds?

A. .5 cm/s B. .2 cm/s C. 2 cm/s D. 5 cm/s E. 20/3 cm/sec

123. If the ant travels 11 seconds, **estimate the distance** it would travel.

A. 10 cm B. 20 cm C. 55 cm D. 75 cm E. None of the above

Use the bar graph data on music sales below for problems #124-125.



124. Which value of change shows the **largest difference month to month** in the sales of music systems?

A. 600 B. 400 C. 300 D. 200 E. None of the above

125. Which statement is **NOT** true based on the data on the sales of music systems?

A. The total number of sales from January through May was greater than 3,000.
B. The median sales month is May.
C. The range of total sales was approximately 580 comparing April and February.
D. Sales climbed between February and April.
E. All are true statements.

Use the table showing possible sums resulting from rolling two dice to answer problems #126-129.

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

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

127. What is the probability of getting a **sum that is greater than or equal to 5**?

A. 1/6 B. 1/3 C. 1/2 D. 4/9 E. 5/6

128. What is the probability of getting an **even sum greater than or equal to 7?**

A. 1/4 B. 5/18 C. 5/12 D. 1/2 E. None of the above

129. What is the probability of getting a **multiple of 4 And factor of 12**?

A. 2/27 B. 1/4 C. 1/3 D. 1/12 E. None of the above

Use the average temperatures of Franklin and Jackson for problems #130-132.

Average Monthly High Temperature (F°) For Two U.S. Cities

	Franklin	Jackson
Jan.	29	15
Feb.	30	20
Mar.	35	22
Apr.	40	30
May	42	45
June	58	58
July	60	78
Aug.	59	77
Sept.	50	60
Oct.	42	58
Nov.	38	32
Dec.	30	20

130. **Which average of the averages is greater and by how much?**

A. Jackson by 0.17º B. Franklin by 0.17º C. Jackson by 1.7º
D. Franklin by 1.7º E. None of the above

131. What is the **difference between the lowest temperatures** in both cities?

A. 19º B. 18º C. 14º D. 31º E. None of the above

132. What is the **mode** temperature in Jackson?

A. 30º B. 58º C. 20º D. 20º and 58º E. None of the above

133**. How many different ways** can four people be seated at a circular table.?

A. 5 B. 15 C. 120 D. 25 E. None of the above

134. You are packing your suitcase for a trip to Grandma's home. You choose from 4 different shirts, 2 pair of pants, and 2 sweaters. **How many different outfits** can you choose to wear?

A. 4 B. 8 C. 12 D. 16 E. 32

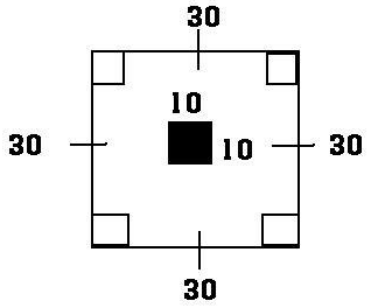
135. **How many different ways** can a four person committee be selected from a group of 10 people?

A. 1 B. 40 C. 210 D. 5040 E. 3,628,000

136. **How many different ways can 7 people shake hands with each other?**

A. 7 B. 14 C. 42 D. 49 E. 5040

137. Find the **probability** of landing anywhere the larger square?

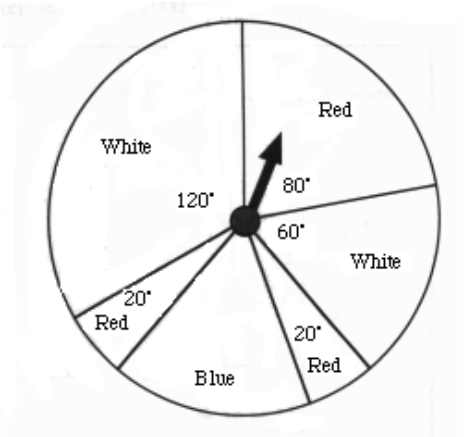


A. 1/9 B. 1/6 C. 1/3 D. 1/10 E. 1

138. If you scored 84%, 75%, 70%, and 86%, **what would it take on your next test** to get an average score of exactly 80%?

A. 84% B. 85% C. 86% D. 87% E. None of the above

Use the figure below for problems #139-140.



139. What is the probability of landing in the **Red** sections on the circle?

A. 0.056 B. 0.111 C. 0.222 D. 0.333 E. None of the above

140. What is the probability of landing in the **Blue** section on the circle?

A. 0 B. 1/6 C. 1/3 D. 1/2 E. None of the above