Kansas City Area Teachers of Mathematics
2016 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 _____

Use the box plot on heights of 7th graders to answer problems #101-105.

Height of Seventh-Grade Students (inches)
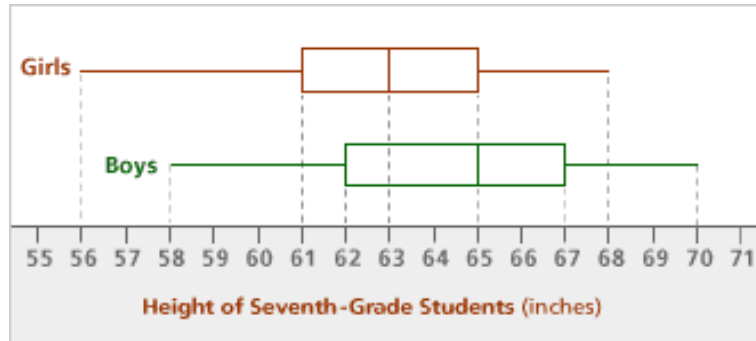
101. Find the **difference in ranges** from the girls (top graph) to the boys (bottom graph).

   A. The ranges are the same.
   B. The boys' range is 1 greater than the girls' range.
   C. The girls' range is 1 greater than the boys' range.
   D. The girls' range is 2 greater than the boys' range.
   E. None of the above

102. Find the **difference in the interquartile ranges** from the girls to the boys.

   A. The interquartile ranges are the same.
   B. The boys' interquartile is 1 greater than the girls' interquartile.
   C. The girls' interquartile is 1 greater than the boys' interquartile.
   D. The girls' interquartile is 2 greater than the boys' interquartile.
   E. None of the above

103. Based on this data, what is the **median height of a boy** in 7th grade?

   A. 58"   B. 62"   C. 65"   D. 67"   E. None of the above

104. Based on this data, what is the **maximum height of a girl** in 7th grade? What would this height be in feet and inches?

   A. 65" ; 5'5"   B. 68" ; 5'8"   C. 67" ; 5'7"
   D. 70" ; 5'10"   E. None of the above

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

   A. Boys are generally taller than girls in 7th grade.
   B. Twenty-five percent of the boys were between 65"-67" tall.
   C. The shortest boy was 2 inches taller than the shortest girl.
   D. The mean of the heights for girls is 63" or 5'3" tall.
   E. None of the above

106. 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 <u>not</u> selecting a Democrat?**

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

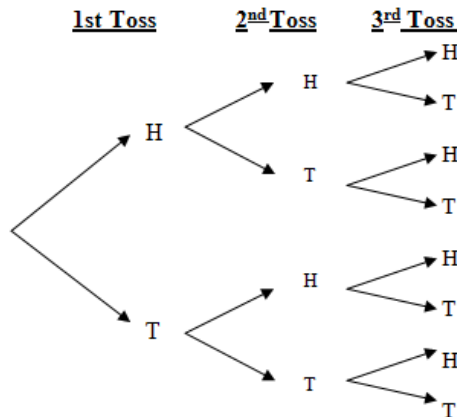
107. A regular six-sided die is tossed. **What is the probability of getting a factor of 30?**

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

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

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

For problems #109-110, three fair coins are flipped.

109.   What is the probability that **all three are heads**?

   A. 1/2   B. 1/3   C. 1/4   D. 1/8   E. None of the above
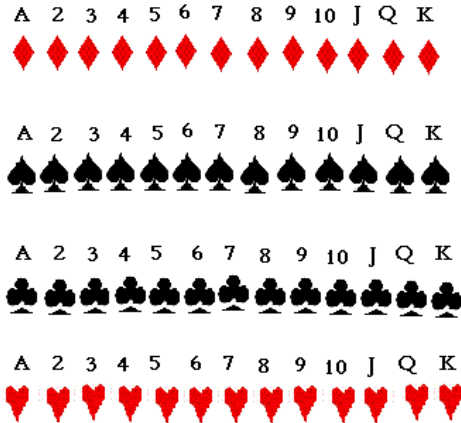
110.   What is the probability that **two are heads and one is a tail**?

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

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

   A. 1/2   B. 7/8   C. 5/8   D. 3/8   E. None of the above

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

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112. How many cards are in a standard deck ?

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

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

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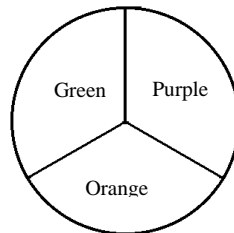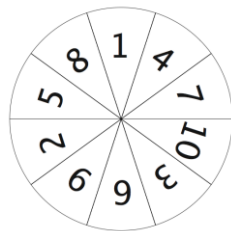   D. 0.06   E. None of the above

114. What is the probability of getting an **Ace of Diamonds or an Ace of Hearts?**
    A. 1/13   B. 2/25   C. 1/52
    D. 1/26   E. None of the above

115. What is the probability of getting an **even numbered card?**
    A. 0.192   B. 0.423   C. 0.385
    D. 0.231   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 secondary 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. 30%   C. 40%   D. 50%   E. None of the above

118. When spinning both spinners, what is the probability that you will spin a 10 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. 107   C. 119   D. 213   E. None of the above

120. What is the **mean height** of the trees?

   A. 151.6'   B. 105'   C. 310'   D. 148.7'   E. None of the above

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

   A. 0.4 ft.   B. 5 ft.   C. 4 ft.   E. 8.8 ft.   E. None of the above

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Use the graph on the distance an ant travels over time for problems #122-123.
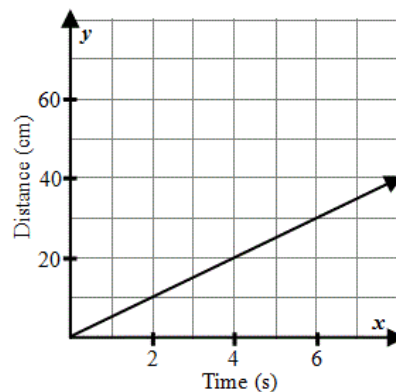
122.   What is the **rate** at which the ant travels?
     A. 5 cm/s   B. 0.5 cm/s   C. 2 cm/s   D. 20/3 cm/s   E. None of the above

123.   If the ant travels 15 seconds, **estimate the distance** it would travel.

   A. 40cm   B. 45cm   C. 60cm   D. 75cm   E. None of the above

Use the bar graph data on music sales below for problems #124-125.
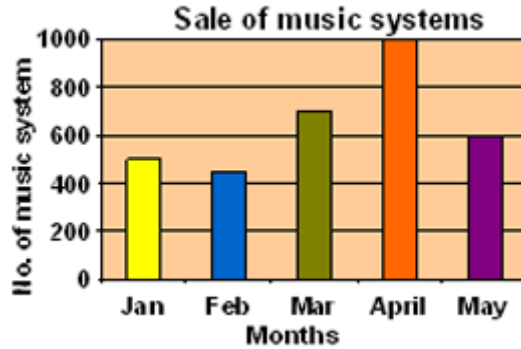
124. What is the **difference** between the sales in April and May?

   A. 500   B. 400   C. 600   D. 300   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. 5/12   C. 23/36   D. 1/2
   E. None of the above

127. 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

128. 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

129. 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

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

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

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

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

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

133. **How many different ways** can the letters in PIANO be rearranged?

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

134. You are selecting your outfit for today. You choose from 3 different shirts, 2 pair of shoes, and 3 pair of shorts. **How many different outfits** did you have to choose from?

   A. 8   B. 4   C. 3   D. 12   E. None of the above
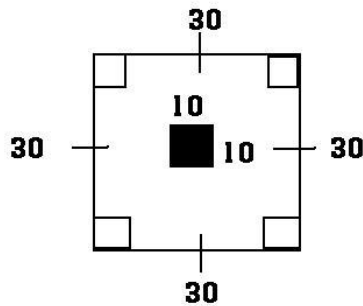
135. **How many different ways** can 6 books be placed on a shelf?

   A. 720   B. 120   C. 60   D. 6   E. None of the above

136. **How many different ways can 8 people shake hands with each other.**

   A. 64   B. 56   C. 88   D. 49   E. None of the above

137. Find the **probability** of landing in the small square inside the larger square?

30

10

30   10   30

30

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

E. None of the above

138. If you scored 84%, 78%, 73%, and 90%, **what would it take on your next test** to get an average score of exactly 82%?

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

Use the figure below for problems #139-140.

Red

White

80°

120°

60°

White

20°

Red

20°

Red
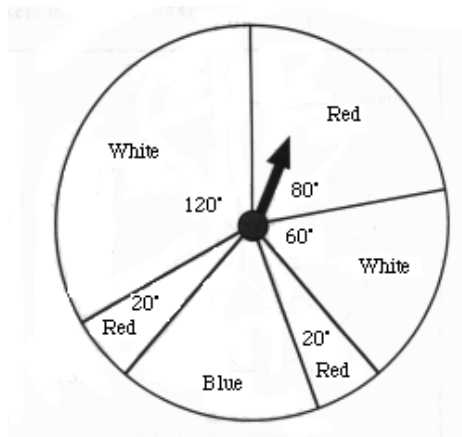
Blue

139. What is the probability of landing in the **Red** sections on the circle?
   A. 0.222   B. 0.056   C. 0.278   D. 0.111   E. None of the above

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

B. 0.306   B. 0.611   C. 0.333   D. 0.167   E. None of the above

Shade the correct answer!   Name_____

Example: A   ●   C   D   E   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!   Name_____
Example: A ● C D E   School _____

ANSWER KEY

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