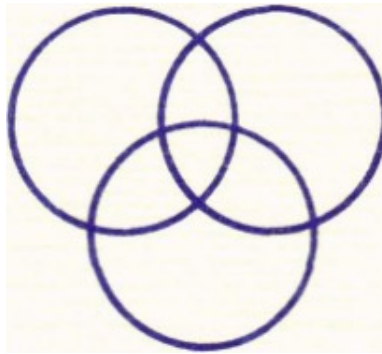


Broward County Council of Teachers of Mathematics



Annual Contest
2016

Grade 6/Pre-Algebra 7

BCCTM Middle School Math Competition 2016: Grade 6/Pre-Algebra 7

DIRECTIONS:

You may write on this test copy. Select the best answer for each question. If the answer is not listed, choose (E) NOTA (NONE OF THE ABOVE). Be sure to bubble your answers on your scantron using a #2 pencil within the time allowed.

Do NOT change any information or codes on your scantron. If you have any questions, ask the proctor.

Where appropriate, use 3.14 for π .

You have 45 minutes to complete this test. A 10-minute warning will be given.

- (1) What is the correct ordering of the three numbers, $\frac{5}{19}$, $\frac{7}{21}$, and $\frac{9}{23}$, in increasing order?

(A) $\frac{9}{23} < \frac{7}{21} < \frac{5}{19}$

(B) $\frac{5}{19} < \frac{9}{23} < \frac{7}{21}$

(C) $\frac{5}{19} < \frac{7}{21} < \frac{9}{23}$

(D) $\frac{7}{21} < \frac{5}{19} < \frac{9}{23}$

(E) NOTA

- (2) $(6 ? 3) + 4 - (2 - 1) = 5$. To make this statement true, the question mark between the 6 and 3 should be replaced by which of the following:

(A) \div (B) \times (C) $+$ (D) $-$ (E) NOTA

- (3) Which triplet of numbers has a sum NOT equal to 1?

(A) $(\frac{1}{2}, \frac{1}{3}, \frac{1}{6})$ (B) $(2, -2, 1)$ (C) $(1.4, -2.4, 1)$ (D) $(-\frac{3}{2}, -\frac{5}{2}, 5)$ (E) NOTA

- (4) On a map, a 12-centimeter length represents 72 kilometers. How many kilometers does a 17-centimeter length represent?

(A) 92 (B) 102 (C) 112 (D) 122 (E) NOTA

- (5) The ratio of the number of games won to the number of games lost (no ties) by the Middle School Wildcats is $\frac{11}{4}$. To the nearest whole percent, what percent of its games did the team lose?

(A) 27 (B) 36 (C) 45 (D) 73 (E) NOTA

- (6) The sum of two numbers is S . Suppose that 3 is added to each number and then each of the resulting numbers is doubled. What is the sum of the final two numbers?

(A) $2S + 3$ (B) $3S + 6$ (C) $2S + 6$ (D) $2S + 12$ (E) NOTA

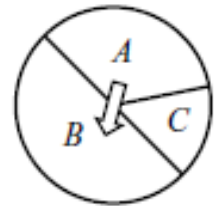
- (7) For $x = 7$, which of the following is smallest?

(A) $\frac{6}{x}$ (B) $\frac{6}{x+1}$ (C) $\frac{6}{x-1}$ (D) $\frac{x}{6}$ (E) NOTA

- (8) Matthew wants to buy a \$500 mountain bike. For his birthday, his sister sends him \$50, his aunt sends him \$35, and his cousin gives him \$15. He earns \$16 per week for his paper route. He will use all of his birthday money and all of the money he earns from his paper route. In how many weeks will he be able to buy the mountain bike?

(A) 24 (B) 25 (C) 26 (D) 27 (E) NOTA

- (9) A board game spinner is divided into three regions labeled A, B, and C. The probability of the arrow stopping on region A is $\frac{1}{3}$ and on region B is $\frac{1}{2}$. What is the probability of the arrow stopping on region C?



(A) $\frac{1}{12}$ (B) $\frac{1}{6}$ (C) $\frac{1}{5}$ (D) $\frac{1}{3}$ (E) NOTA

- (10) A rectangle is twice as long as it is wide. Its perimeter is 72 cm. What is its area in square centimeters?

(A) 96 (B) 144 (C) 256 (D) 288 (E) NOTA

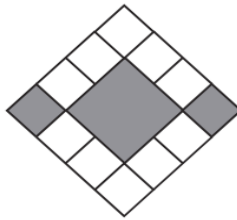
(11) $\frac{\frac{3}{8} + \frac{7}{8}}{\frac{4}{5}} =$

(A) 1 (B) $\frac{25}{16}$ (C) 2 (D) $\frac{43}{20}$ (E) NOTA

- (12) Steve's empty swimming pool will hold 24,000 gallons of water when full. It will be filled by 4 hoses, each of which supplies 2.5 gallons of water per minute. How many hours will it take to fill Steve's pool?

(A) 40 (B) 42 (C) 44 (D) 46 (E) NOTA

- (13) In the figure, what is the ratio of the area of the gray squares to the area of the white squares?



(A) 5 (B) 10 (C) 15 (D) 20 (E) NOTA

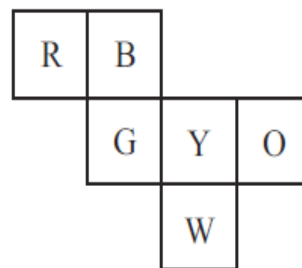
- (14) A shop advertises that everything is "half price in today's sale." In addition, a coupon gives a 20% discount on sale prices. Using the coupon, the price today represents what percentage discount off the original price?

(A) 33 (B) 40 (C) 60 (D) 70 (E) NOTA

- (15) Aunt Anna is 42 years old. Caitlin is 5 years younger than Brianna, and Brianna is half as old as Aunt Anna. How old is Caitlin?

(A) 15 (B) 16 (C) 17 (D) 21 (E) NOTA

- (16) Six squares are colored, front and back, (R = red, B= blue, O= orange, Y= yellow, G= green, W= white). They are hinged together as shown, then folded to form a cube. The face opposite the white face is:



(A) Blue (B) Green (C) Orange (D) Red (E) NOTA

(17) Twenty percent less than 60 is one-third more than what number?

- (A) 32 (B) 36 (C) 48 (D) 144 (E) NOTA

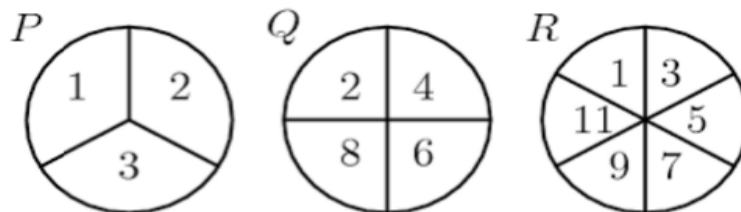
(18) A rectangular photograph is placed in a frame that forms a border two inches wide on all sides of the photograph. The photograph measures 8 inches high and 10 inches wide. What is the area of the border, in square inches?

- (A) 40 (B) 64 (C) 72 (D) 88 (E) NOTA

(19) Isabella must take four 100 – point tests in her math class. Her goal is to achieve an average grade of at least 95 on the tests. Her first two test scores were 97 and 91. After seeing her score on the third test, she realized that she could still reach her goal. What is the lowest possible score she could have made on the third test?

- (A) 90 (B) 91 (C) 92 (D) 93 (E) NOTA

(20) Jeff rotates spinners P, Q, and R and adds the resulting numbers. What is the probability that his sum is an odd number?



- (A) $\frac{1}{4}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) NOTA

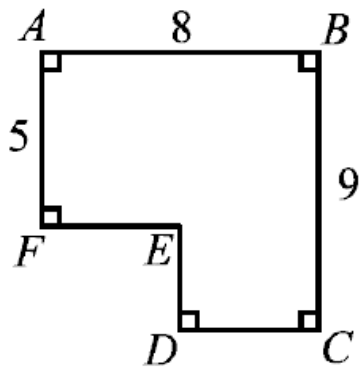
(21) There are 270 students at Colfax Middle School, where the ratio of boys to girls is 5 : 4. There are 180 students at Winthrop Middle School where the ratio of boys to girls is 4 : 5. The two schools hold a dance and all students from both schools attend. What fraction of the students at the dance are girls?

- (A) $\frac{7}{18}$ (B) $\frac{7}{15}$ (C) $\frac{22}{45}$ (D) $\frac{23}{45}$ (E) NOTA

(22) A mixture of 30 liters of paint is 25% red tint, 30% yellow tint, and 45% water. Five liters of yellow tint are added to the original mixture. What is the percent of yellow tint in the new mixture?

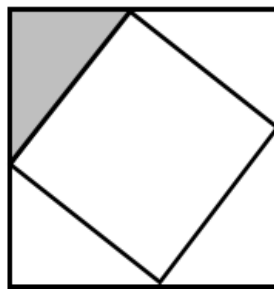
- (A) 25 (B) 35 (C) 40 (D) 45 (E) NOTA

(23) The area of polygon ABCDEF is 52 with $AB = 8$, $BC = 9$, and $FA = 5$. What is $DE + EF$?



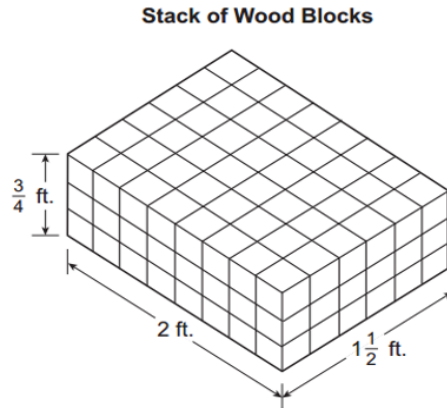
- (A) 7 (B) 8 (C) 9 (D) 10 (E) NOTA

(24) The larger square shown at the right has a perimeter of 56 and the smaller square of 40. What is the area of the shaded region? (Note: Drawing not to scale.)



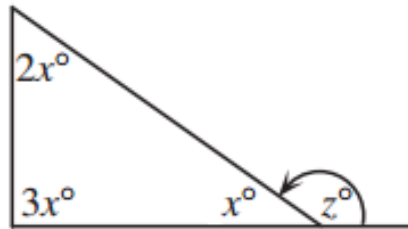
- (A) 24 (B) 24.5 (C) 25 (D) 25.5 (E) NOTA

- (25) Mark has a stack of wood blocks. The edge length of each wood block $\frac{1}{4}$ of a foot. The stack is in the shape of a rectangular prism as shown below.

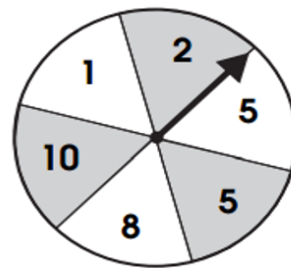


What is the volume, in cubic feet, of the stack of wood blocks?

- (A) $1\frac{1}{3}$ ft³ (B) $2\frac{1}{4}$ ft³ (C) $3\frac{3}{8}$ ft³ (D) $4\frac{1}{4}$ ft³ (E) NOTA
- (26) Find the value of z , in degrees, in the diagram below.



- (A) 90° (B) 120° (C) 150° (D) 180° (E) NOTA
- (27) The 2 on the spinner shown will be replaced with a 7. How does the probability of the spinner landing on an even number change?



- (A) Increases by $\frac{1}{6}$ (B) Decreases by $\frac{1}{6}$ (C) Increases by $\frac{1}{3}$ (D) Decreases by $\frac{1}{3}$ (E) NOTA

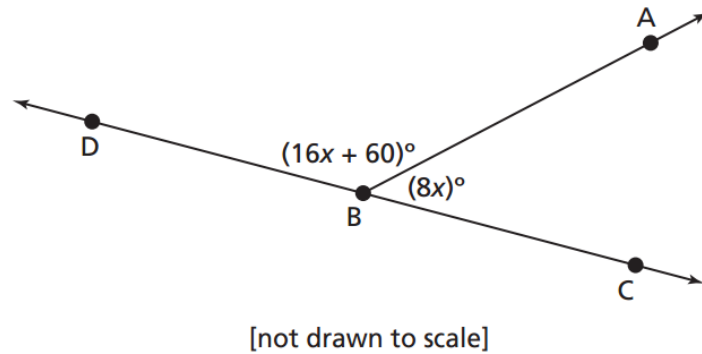
(28) On a standard die with six faces, each face contains a different number from 1 through 6. Jake has a non-standard die with six faces, and each face on Jake's die contains an expression with a different value from 1 through 6. In no particular order, the six expressions are $a + 1$, $2a - 5$, $3a - 10$, $b + 8$, $2b + 5$, and $3b + 10$. If a and b are integers, what is the value of the product $a \times b$?

- (A) -8 (B) -4 (C) 4 (D) 8 (E) NOTA

(29) What is the value of $\frac{3}{4}$ of 25% minus 75% of one-fourth?

- (A) 0 (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{3}{4}$ (E) NOTA

(30) What is the measure, in degrees of $\angle ABC$?



- (A) 2.5° (B) 20° (C) 80° (D) 100° (E) NOTA