


MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2018 MATH CONTEST
POTLUCK

DIRECTIONS: DO NOT WRITE ON THIS TEST. Place the best answer for each question on the separate answer sheet.

1. If the point $(2, -3)$ is rotated 180° about the origin, where is the rotated point, A' , located?
A) $(2, 3)$ B) $(-3, -2)$ C) $(-3, 2)$ D) $(-2, 3)$ E) none of these
2. Solve for x : $y = 2x + 3$
A) $x = \frac{1}{2}y - \frac{3}{2}$ B) $x = \frac{1}{2}y - 3$ C) $x = y - \frac{3}{2}$ D) $x = \frac{1}{2}y + \frac{3}{2}$ E) none of these
3. How many prime numbers are between 50 and 60?
A) 1 B) 2 C) 3 D) 4 E) none of these
4. If $\frac{\frac{5}{8}}{0.25}$ is expressed as a fraction in lowest terms, what number will be in the denominator?
A) 2 B) 4 C) 5 D) 8 E) none of these
5. A candy jar contains 20 candies: 8 are orange 7 are green and 4 are red. Two candies are picked at random and eaten. If both of these are orange, what is the probability that the next candy, picked at random, is also orange?
A) $\frac{4}{9}$ B) $\frac{3}{10}$ C) $\frac{1}{3}$ D) $\frac{2}{5}$ E) none of these
6. The choices for an ice cream sundae are as follows: chocolate or vanilla ice cream; hot fudge, strawberry, or butterscotch toppings; and toasted almonds, cherry, or sprinkles as decoration. If you know that your sundae will have one ice cream, one topping and one decoration, how many different choices for a sundae do you have?
A) 8 B) 9 C) 12 D) 18 E) none of these
7. A line containing the point $(2, 4)$ has slope 3. If point P lies on this line, which of the following could be point P?
A) $(1, 7)$ B) $(2, 7)$ C) $(5, 5)$ D) $(3, 7)$ E) none of these
8. Line segment AB has midpoint $(7, -1)$. If point A has coordinates $(2, 6)$, then what are the coordinates of point B?
A) $(9/2, 5/2)$ B) $(19/2, -9/2)$ C) $(12, -8)$ D) $(14, -8)$ E) none of these
9. The formula for the area of a trapezoid is: $A = \frac{1}{2}h(b_1 + b_2)$. Which of the following are true?
I: $b_1 = \frac{2A}{h} - b_2$ II: $b_1 = \frac{2A - hb_2}{h}$ III: $b_1 = (2A - h) - b_2$
A) I and II B) II and III C) I and III D) I, II and III E) none of these
10. Three consecutive odd integers such that three times the middle integer is 25 more than the sum of the smallest and largest. Which is the largest of the three integers
A) 21 B) 23 C) 25 D) 27 E) none of these
11. If you have 100 positive numbers, which statement must be true?
A) (the sum of the numbers) > 0 B) (the mean of the numbers) \leq (the largest number)
C) (the median) \geq (the smallest number) D) (the largest number) \geq (the smallest number) E) All of these
12. If you have 100 positive numbers, which is larger?
A) the sum of the numbers B) (the mean of the numbers times 100) + 1
C) the median D) the mode E) not enough information

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13. What is in the 100th decimal place of the decimal equivalent of $\frac{22}{7}$?
- A) 2 B) 4 C) 5 D) 8 E) none of these
14. What is the 10th term of this pattern? 8, 4, 2, 1, ...
- A) $\frac{1}{2^4}$ B) $\frac{1}{2^6}$ C) $\frac{1}{2^8}$ D) $\frac{1}{2^{10}}$ E) none of these
15. A scale drawing of a new building has $\frac{1}{2}$ inch representing 40 feet. If a conference room has a floor length of 60 feet, what is the floor length, in inches, on the scale drawing?
- A) $\frac{3}{4}$ B) $\frac{7}{8}$ C) 1 D) $1\frac{1}{2}$ E) none of these
16. Joan watched a movie on television from 2 pm until 5 pm. The first hour there were 20 minutes of commercials, second hour there were 15 minutes of commercials and the last hour there were 10 minutes of commercials. What percent of the viewing time was not commercials?
- A) 25% B) 45% C) 55% D) 75% E) none of these
17. John spent $\frac{1}{5}$ of his allowance on notebooks, $\frac{1}{4}$ of what was left on candy, $\frac{1}{3}$ of what was left (after the notebook and candy purchases) on bus tickets, and $\frac{1}{2}$ of what was finally left on a snack. He then has \$6 left over. What was his allowance?
- A) \$20 B) \$30 C) \$40 D) \$50 E) none of these
18. If the formula $P=0.5643Y - 1092.57$ can be used to predict the average price of a theatre ticket after 1945, for what years will the average theatre ticket price be at least 41 dollars? (Y is the actual year.) Round the nearest year.
- A) 2,011 or after B) 2,007 or after C) 2,009 or after D) 2,019 or after E) none of these
19. The total sales made by a salesperson was \$25,000 after 3 months and \$68,000 after 23 months. Assuming a linear relationship, predict the total sales after 28 months.
- A) \$78,850 B) \$78,750 C) \$78,792 D) \$78,720 E) none of these
20. If $\frac{1}{5}$ of a number is 2, what is $\frac{1}{2}$ of the number.
- A) 2 B) 3 C) 5 D) 10 E) none of these
21. In the sequence: 8, 9, 12, 17, 24, ... , a certain pattern determines each number that follows. What is the next number in the sequence.
- A) 29 B) 30 C) 33 D) 35 E) none of these
22. If each square in the figure has a side of length 1, what is the perimeter?
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- A) 10 B) 12 C) 15 D) 20 E) none of these
23. If point P(1,1) and Q(1,0) lie on the same coordinate graph, which must be true?
- I. P and Q are equidistant from the origin.
II. P is farther from the origin than P is from Q.
III. Q is farther from the origin than Q is from P.
- A) I only B) II only C) III only D) I and II E) none of these
24. If point P (1,3) is reflected across the line $y = x$, what are the new coordinates?
- A) (-1,3) B) (1,-3) C) (3,1) D) (-3,-1) E) none of these

POTLUCK 2018 Answer Key

1. D
2. A
3. B
4. A
5. C
6. D
7. D
8. C
9. A
10. D
11. E
12. B
13. D
14. B
15. A
16. D
17. B
18. C
19. B
20. C
21. C
22. B
23. B
24. C