

MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2015 MATH CONTEST
POTLUCK

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

- How many positive integers makes this inequality true? $1000 \leq x \leq 2000$?
A) 999 B) 1000 C) 1001 D) 1002 E) none of these
- What is the area of the triangle with vertices $(-1, 3)$, $(-1, -1)$, and $(2, 3)$?
A) 2 units² B) 4.5 units² C) 6 units² D) 12 units² E) none of these
- A pair of six-sided dice is rolled, and the sum is recorded. What is the probability that this sum is a multiple of six?
A) $1/6$ B) $1/12$ C) $1/18$ D) $1/36$ E) none of these
- How many two-digit prime numbers have a units digit of 1?
A) 5 B) 6 C) 7 D) 8 E) none of these
- There are eight teams in a basketball league. Each team will play all of the other teams in a home game and an away game. How many games will be played in the regular basketball season?
A) 56 B) 64 C) 112 D) 128 E) none of these
- What is the solution to $3(8 - x) = 5(x + 4)$?
A) $20/6$ B) $-1/2$ C) 2 D) $1/2$ E) none of these
- Solve $4x + 2y = 12$ for y .
A) $y = -2x + 6$ B) $y = 2x - 6$ C) $y = -1/2x + 3$ D) $y = -4x + 12$ E) none of these
- What is the slope and y-intercept of the line $y = -3x + 4$?
A) $m = 2, b = -4$ B) $m = 4, b = -3$ C) $m = -3, b = 1$ D) $m = 3, b = 4$ E) none of these
- At what point do the lines intersect?
 $y = 2x - 8$
 $x + y = 4$
A) $(0, 4)$ B) $(3, 2)$ C) $(4, 0)$ D) no solution E) none of these
- What is the x-intercept of this line: $x + 3y = 18$?
A) 1 B) 3 C) 6 D) 18 E) none of these

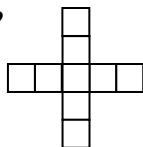
11. How many boxes are in step 100?



Step 1



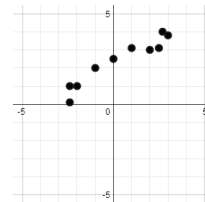
Step 2



Step 3

- A) 104 B) 397 C) 400 D) 404 E) none of these

POTLUCK 2015 page 2



12. Describe the association shown in this scatterplot.
A) Positive B) Negative C) No Association
D) Home Owners E) none of these
13. What is the next term in this sequence of numbers? 1, 8, 27, 64, 125, ...
A) 144 B) 171 C) 196 D) 216 E) none of these
14. In an arithmetic sequence, the first term is 10 and the fifth term is 98. What is the second term?
A) 22 B) 30 C) 32 D) 34 E) none of these
15. On a math test, 2nd period has 20 students and had a class average of 70%, while 3rd period has 30 students and had a class average of 80%. What was the average of all 50 students combined?
A) 73 B) 74 C) 75 D) 76 E) none of these
16. The square of Bob's and Mary's ages have a sum of 221. Their ages have a difference of 1. If Bob is older than Mary, how old is Bob?
A) 14 B) 15 C) 16 D) 18 E) none of these
17. What is the slope of the line that passes through the points (24, 21) and (15, -24)?
A) -5 B) -1/5 C) 1/5 D) 5 E) none of these
18. One January 1st, gas cost \$3.50 per gallon. On February 1st, the price of gas was \$3.85 per gallon. What was the percent increase on the cost of gas that month?
A) 1% B) 10% C) 90% D) 110% E) none of these
19. Bill has an average of 85% on 4 tests. If there are two more tests, what is the highest average percent he can get on the six tests, if the highest score on each test is 100%?
A) 47.5% B) 85% C) 90% D) 95% E) none of these
20. A cube has a volume of 8. When each edge length is quadrupled, what is the volume of the new cube?
A) 32 B) 64 C) 128 D) 512 E) none of these
21. Jill is putting a fence in her back yard that is 120 feet by 40 feet. There needs to be a fence post every 8 feet. How many posts will she need?
A) 38 B) 39 C) 40 D) 42 E) none of these
22. Triangle ABC is similar to triangle DEF. $AB = 3$, $BC = 4$, and $CA = 5$. If $DE = 6$, what is the area of triangle DEF?
A) 6 B) 12 C) 24 D) 48 E) none of these
23. What is the area of a rectangle with side lengths of $3n$ and $6n - 1$?
A) $18n^2 - 3n$ B) $18n - 2$ C) $18n - 1$ D) $18n^2 - 1$ E) none of these

POTLUCK 2015 Answer Key

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