

MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2016 MATH CONTEST
POTLUCK

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

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Use the following information to answer questions 1-3.

John received the following test scores in math over the past semester: 74, 90, 83, 80, 87, 90

1. What is the mean of his test scores?
A) 82 B) 84 C) 88 D) 90 E) None of these
2. What is the median of his test scores?
A) 82 B) 84 C) 85 D) 90 E) None of these
3. What is the mode of his test scores?
A) 82 B) 84 C) 85 D) 90 E) None of these
4. Harry Potter has 5 cloaks of invisibility, 3 wands, and 2 Firebolts. How many arrangements are possible if he brings one of each item to class?
A) 10 B) 20 C) 30 D) 40 E) None of these

Use the following information to answer questions 5-7. You pick one number from the set of natural numbers up to and including 20.

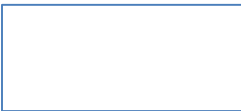
5. What is the probability that you choose a number that is a multiple of 4?
A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{5}$ D) $\frac{1}{2}$ E) None of these
6. What is the probability that you choose a number that is a factor of 12?
A) $\frac{2}{5}$ B) $\frac{7}{10}$ C) $\frac{3}{7}$ D) $\frac{3}{10}$ E) None of these
7. What is the probability of picking a prime number?
A) $\frac{7}{20}$ B) $\frac{9}{20}$ C) $\frac{2}{5}$ D) $\frac{1}{2}$ E) None of these
8. If a wheel has a radius of 5 inches, find the number of times the wheel would rotate to go a distance of 157 inches. Use 3.14 for pi.
A) 5 rotations B) 10 rotations C) 20 rotations
D) 25 rotations E) None of these
9. If you have a square with an area of 169 cm^2 , what is the perimeter of the square?
A) 338 cm B) 52 cm C) 26 cm D) 676 cm E) None of these
10. Triangle DEF is similar to triangle XYZ. $DE=3$, $EF=4$, $FD=5$. If $XY=6$ what is the perimeter of triangle XYZ?
A) 20 B) 12 C) 18 D) 15 E) None of these
11. What is the slope of a line that passes through the points $(-5,-1)$ and $(-5,-8)$?
A) -7 B) 0 C) $-\frac{9}{10}$ D) Undefined E) None of these

POTLUCK 2016 page 2

Use the following information to answer questions 12-14. Josh has pool that is 10 feet deep, 8 feet wide, and 15 feet long. He is draining the pool at a rate of 60 cubic feet per hour. His pool is 75% full.

12. How many cubic feet of water is in the pool before Josh starts draining it?
A) 900 B) 1000 C) 1100 D) 1200 E) None of these
13. How many hours will it take to drain half of the water out of the pool?
A) 5 B) 20 C) 12.5 D) 7.5 E) None of these
14. How many hours will it take to drain all the water out of the pool?
A) 10 B) 40 C) 25 D) 15 E) None of these
15. Simplify: $\frac{7!}{5!}$
A) $\frac{7}{5}$ B) 35 C) 42 D) 0 E) None of these

Use the following information for questions 16-19. On your family's cell phone plan, the initial cost is \$75 and each MB of data cost \$0.40 extra. Your parents decide that their monthly budget for the cell phone plan is at most \$100.

16. Which of the following represents this situation?
A) $75 + 0.40x \leq 100$ B) $75 + 0.40x < 100$ C) $75 + 0.40x \geq 100$
D) $75 + 0.40x > 100$ E) None of these
17. What is the maximum amount of MB that your family can use without going over the \$100 budget?
A) 10 B) 28.5 C) 62.5 D) 70 E) None of these
18. If your family uses 30 MB of data, how much of the budget will remain?
A) 87 B) 13 C) 12 D) 54 E) None of these
19. Your parents decide to increase the cell phone budget by 30%. What is the new maximum amount of MB that your family can use without going over the new budget?
A) 137.5 B) 130 C) 128.5 D) 145 E) None of these
20. A cube has a volume of 27. When each edge is quadrupled, what is the volume of the new cube?
A) 144 B) 729 C) 1331 D) 1728 E) None of these
21. What is the area of a rectangle with side lengths $5k$ and $-7k+4$?
A) $-35k^2+20k$ B) $-35k^2+4$ C) $35k^2+20k$
D) $35k^2+20$ E) None of these
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22. What is the probability of rolling a standard die and getting an even number?
A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{1}{6}$ D) $\frac{2}{3}$ E) None of these
23. What is the next number in the sequence: 1, 3, 6, 10...
A) 20 B) 12 C) 15 D) 18 E) None of these

POTLUCK 2016 Answer Key

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