



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS  
2017 MATH CONTEST  
Number Concepts

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

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- Write  $7\frac{13}{20}$  as a percent.  
A) 0.0765 %      B) 0.713%      C) 7.13%      D) 7.65%      E) none of these
- Find the prime factorization of 600.  
A)  $2 \cdot 3 \cdot 10^2$       B)  $2^3 \cdot 3 \cdot 5^2$       C)  $2 \cdot 3 \cdot 4 \cdot 5^2$       D)  $2 \cdot 8 \cdot 5^2$       E) none of these
- A total of 18 students received A's on the last math test. This represents 60% of the class. How many students received B or less?  
A) 10      B) 12      C) 16      D) 20      E) none of these
- What is the mean of the first 49 positive integers?  
A) 24      B) 25      C) 26      D) 34      E) none of these
- What's the first prime number greater than 67?  
A) 68      B) 71      C) 73      D) 81      E) none of these
- A stack of 720 concrete half blocks forms a rectangular prism that is 10 feet wide by 8 feet long. How many blocks high is this?  
A) 4      B) 6      C) 9      D) 20      E) none of these
- Yvonne was the first person to arrive at the theater to see *Star Wars*. Each group that arrived after Yvonne had 2 more people than the previous group. After the sixteenth group arrived, how many people were there in the theater?  
A) 124      B) 136      C) 255      D) 256      E) none of these
- A family has narrowed its choice for floor tiles to three. One is 6 inches by 8 inches, one 4 inches by 4 inches, and the third is 3 inches by 5 inches. The floor is 8 feet by 10 feet 8 inches. Which of the tile choices will fit, without cutting any of the tiles?  
A) 1<sup>st</sup>, 2<sup>nd</sup>      B) 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>      C) 2<sup>nd</sup>, 3<sup>rd</sup>      D) 2<sup>nd</sup>      E) none of these
- What is the next number in the sequence: 1, 8, 27, 64...  
A) 91      B) 100      C) 125      D) 128      E) none of these
- There are 47 students who play soccer, 31 who play softball, and 39 who play basketball. Of these, 12 play soccer and softball, 17 play softball and basketball, and 15 play basketball and soccer. Five students play all 3. How many play only 1 sport?  
A) 38      B) 44      C) 50      D) 76      E) none of these

## NUMBER CONCEPTS 2017 page 2

Use the following information for questions: 11-14.

Students scored the following percentage on their Spanish exam: 70, 80, 84, 90, 99, 64, 84, 92, 97, 87.

11. What is the mean?

- A) 64                      B) 82.3                      C) 84.7                      D) 85.5                      E) none of these

12. What is the median?

- A) 64                      B) 82.3                      C) 84.7                      D) 85.5                      E) none of these

13. If you made a box and whisker plot of the data, what would the 3<sup>rd</sup> quartile be?

- A) 80                      B) 84                      C) 85.5                      D) 92                      E) none of these

14. If you made a box and whisker plot of the data, what would the inner quartile range be?

- A) 12                      B) 13                      C) 14                      D) 15                      E) none of these

15. Simplify the following expression:  $(6x - 3y + 2z) - (5x - 3y - 6z)$

- A)  $x+6y+8z$                       B)  $x+8z$                       C)  $11x+4z$                       D)  $x+4z$                       E) none of these

16. Tony scored 5 out of 6 questions right on his last quiz. What percentage did he get wrong?

- A) 16.7%                      B) 30%                      C) 56%                      D) 83.3 %                      E) none of these

17. Brandon started his 4-H program with 12 ducks. At the end of summer, he had 250% of his original dozen. How many ducks did he have at the end of summer?

- A) 12                      B) 24                      C) 31                      D) 35                      E) none of these

18. Sue earned a 85% percent on her Earth Science test. She got 68 questions correct, how many questions were on the test?

- A) 58                      B) 68                      C) 80                      D) 125                      E) none of these

19. Sam entered a hot dog eating contest last summer. He ate 7 hot dogs in the first 2 minutes. At this rate, how many hot dogs can he eat in 30 minutes?

- A) 28                      B) 56                      C) 70                      D) 105                      E) none of these

20. Mr. Atkinson noticed that  $\frac{1}{3}$  of his books are fiction. Of those remaining,  $\frac{1}{2}$  are history. Of the rest,  $\frac{3}{4}$  are reference books. The last 5 are poetry. How many books does Mr. Atkinson have in his library?

- A) 60                      B) 120                      C) 132                      D) 150                      E) none of these

21. The area of a rectangle is 2100 square meters. Its width is 8 meters less than its length. Find the dimensions of the rectangle.

- A)  $50 \times 42$                       B)  $70 \times 30$                       C)  $100 \times 21$                       D)  $50 \times 58$                       E) none of these

22. The museum has large square tables that will seat 3 people on each side. They put them together to make one long table for 36 students. How many tables did they use?

- A) 5                      B) 6                      C) 7                      D) 8                      E) none of these

23. Sheri has a block of cheese that is 4 in. by 4 in. by 6 in. She wants to cut the block into 1-inch cubes. What is the **least number of cuts** she can make?

- A) 11                      B) 12                      C) 13                      D) 14                      E) none of these

24. Jennifer is reading a 517 page book. She has already read 125 pages. If she reads 28 pages each day, how many days will it take her to complete the book?

- A) 12                      B) 13                      C) 14                      D) 19                      E) none of these

25. Evaluate the expression:  $2p - 4q + 6r^2$ , when  $p = -3$ ,  $q = 7$ ,  $r = -1$ .

- A) -34                      B) -28                      C) 22                      D) 28                      E) none of these

## Number Concepts 2017 Answer Key

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