



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2018 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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1. What is the smallest 4-digit number that is divisible by 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10?
A) 1000 B) 1020 C) 1060 D) 1080 E) none of these
2. What digit could be used to fill in the blank, 45,2__8 and make the number divisible by both 3 and 8?
A) 2 B) 4 C) 6 D) 8 E) none of these
3. What is the largest number in the prime factorization of 181?
A) 1 B) 3 C) 11 D) 181 E) none of these
4. What is the GCF of 36, 48 and 90?
A) 2 B) 4 C) 12 D) 18 E) none of these
5. What is the base 10 sum of $123_5 + 123_5$?
A) 76 B) 246 C) 1231 D) 5.6×10^{10} E) none of these
6. Tony takes his family out to dinner to celebrate his mother's birthday. The total for the meal is \$124.24 and Tony uses a 20% off coupon. If Tony only tips on his final bill, how much money should he leave for a 20% tip?
A) \$0.40 B) \$4.97 C) \$19.88 D) \$24.85 E) none of these

For questions #7-9, Tony's math grade is only made up of test scores. Each test is worth 10 points. So far this quarter he has earned scores of 8, 9, 10, 10, 7, 8, 9, 10 and 8.

7. If Tony's school uses a standard grading scale, 60-69 is a D, 70-79 is a C, 80-89 is a B and 90-100 is an A, what is Tony's current math grade?
A) A B) B C) C D) D E) none of these
8. Tony's math teacher will let him retake one test for a replacement grade up to a 100%. To the nearest whole percent, what is the largest percent increase of the overall grade Tony can earn if he takes advantage of this opportunity?
A) 1% B) 2% C) 3% D) 4% E) none of these
9. Tony chose not to retake any of his tests from this semester. ☹ The final is worth 50 points. What score must he earn on the final if he wants to have an A on his report card – his "super mean" teacher doesn't round final grades!!!
A) 47 B) 48 C) 49 D) 50 E) none of these

For questions #10-11, Steve must choose between two gym memberships. At Build a Body Gym memberships cost a joining fee of \$100 and then a weekly fee of \$5.00. At Get Mussels members only have to pay \$7.50 a week.

10. If Steve joins Build a Body Gym, how much will a membership cost for 26 weeks?
A) \$130 B) \$140 C) \$170 D) 230 E) none of these
11. When will the cost of these gyms be the same?
A) 35 weeks B) 40 weeks C) 42 weeks D) 45 weeks E) none of these

NUMBER CONCEPTS 2018 page 2

12. I am a whole number. If you multiply me by six, then subtract seven, I am the fifth prime number. What number am I?
A) 3 B) 4 C) 5 D) 6 E) none of these
13. Linda needs $2\frac{1}{3}$ cups of cheese to make one batch of her famous enchiladas. This recipe serves eight people. If she expects 20 guests. What's is the minimum number of cups of cheese she can buy and still meet the recipes proportions?
A) 5 cups B) 6 cups C) 7 cups D) 8 cups E) none of these
14. Andrew is buying new shoes. The shoes he wants cost \$120. He has a 15% off savings card and will pay 6.5% sales tax on the total after his discount. The shoe company is offering a \$15 mail-in rebate. What will Andrew's final price be for the shoes after he receives the rebate in the mail?
A) \$87.24 B) \$93.63 C) \$102.00 D) \$108.63 E) none of these
15. Seven is a prime number, May 7th is a prime day. How many prime days are there in the month of May?
A) 7 B) 8 C) 10 D) 11 E) none of these
16. Sprinkles the dog likes to chase marching bands. When he does, he runs at 18 km per hour. How fast is this in meters per second?
A) 5 B) 6 C) 10 D) 18 E) none of these
17. On a map of Montana the scale reads that one-inch equals 20 miles. If you measure a distance from Missoula to Polson it is $2\frac{3}{5}$ inches, how far is the actual distance in miles?
A) 48 B) 50 C) 52 D) 54 E) none of these
18. Find the 29th term of the arithmetic sequence 4, 11, 18, 25, ...
A) 196 B) 200 C) 203 D) 207 E) none of these
19. Garth rides his bike at 40 km per hour. How far will Garth ride in 3 minutes?
A) 1 km B) 2 km C) 3 km D) 4 km E) none of these
20. In a box of rocks, $\frac{1}{3}$ are igneous, 60 are metamorphic and the remaining 40% are sedimentary. How many rocks are in the box?
A) 160 B) 180 C) 200 D) 225 E) none of these
21. After a long walk yesterday, Cody wants to go 50% farther today in half as much time. She knows she has to walk faster. What percent increase will she have to walk today compared to yesterday to meet her goal?
A) 200% B) 300% C) 400% D) 500% E) none of these
22. In the proportion $\frac{20}{x} = \frac{y}{5}$, how does the value of y change as the value of x gets larger? A) Increases B) Decreases C) Stays the same D) Decreases, then increases
A) increases B) decreases C) stays the same D) decreases then increases E) none of these

Number Concepts 2018 Answer Key

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