



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS  
2011 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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- A jar contains 3 red marbles, 5 white marbles, 1 green marble, and 15 blue marbles. If one marble is picked at random from the jar, what is the probability that it will be red?  
a.)  $\frac{1}{3}$                       b.)  $\frac{1}{8}$                       c.)  $\frac{3}{8}$                       d.)  $\frac{1}{24}$
- The room number of the computer lab is a perfect square. It is not even, but it is a multiple of 3. Which number is it?  
a.) 25                      b.) 27                      c.) 36                      d.) 81
- Michelle earned \$4 last week selling baked goods. If she earns \$36 this week, what is the percent of increase over last week's total?  
a.) 32%                      b.) 36%                      c.) 80%                      d.) 800%
- At the talent show of 200 little children, 150 sing and 60 dance. Of those who dance, 40 sing. How many little children neither sing nor dance?  
a.) 10                      b.) 20                      c.) 30                      d.) 50
- A pizza parlor offers 10 different toppings for its pizza. If no double toppings are allowed, how many ways can a customer select 4 toppings for a pizza?  
a.) 24                      b.) 151200                      c.) 210                      d.) 40
- Corporate salaries are listed for several employees: \$24000, \$24000, \$26000, \$28000, \$30000, \$120000. Which would be the best measure of central tendency?  
a.) mean                      b.) median                      c.) mode                      d.) no difference
- If 1 tic = 3 tacs, and 4 tacs = 5 toes, how many tics equal 1 toe?  
a.)  $\frac{1}{15}$                       b.)  $\frac{1}{5}$                       c.)  $\frac{4}{15}$                       d.)  $\frac{5}{12}$
- A dishwasher on sale for \$279 has an original price of \$350. What is the percent of discount, rounded to the nearest percent?  
a.) 20%                      b.) 25%                      c.) 26%                      d.) 71%
- Find the number of terms contained in the sequence: 12, 22, 32, 42, ..., 342  
a.) 33                      b.) 42                      c.) 36                      d.) 34
- A couch weighs one-third as much as a couch potato. If their total combined weight is 720 kg, how much does the couch potato weigh?  
a.) 540 kg                      b.) 480 kg                      c.) 240 kg                      d.) 180 kg
- A ream of paper contains 500 sheets. A case of 20 reams contains  
a.) 25 sheets                      b.) 500 sheets                      c.) 100 sheets                      d.) 10000 sheets

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12. A certain soap is  $99\frac{44}{100}\%$  pure. The percent of impurities is
- a.)  $\frac{16}{25}\%$                       b.)  $\frac{33}{50}\%$                       c.)  $\frac{14}{25}\%$                       d.)  $1\frac{44}{100}\%$
13. Which number cannot be written as a fraction?
- a.) 3.14                      b.) 0.666666....                      c.) 0.121221222...                      d.) 7
14. Al bought 12 DVDs. Ali bought 15 CDs. Each DVD cost 1.5 times as much as each CD. The ratio of Al's total cost to Ali's was
- a.) 4:5                      b.) 5:4                      c.) 5:6                      d.) 6:5
15. Find the sixth term in the following pattern: A, D, G, J, ...
- a.) P                      b.) M                      c.) O                      d.) R
16. Distance of Softball Throw
- |   |               |
|---|---------------|
| 1 | 5 7           |
| 2 | 2 2 5 6 7 7 7 |
| 3 | 4 5           |
- 115 = 15 yard
- What is the mode of this data?
- a.) 7                      b.) 26                      c.) 27                      d.) 35
17. In Professor Tuffguy's mathematics class, 36 students took the final exam. If the average passing grade was 78, the average failing grade was 60, and the class average was 71, how many of these 36 students passed the final?
- a.) 14                      b.) 22                      c.) 24                      d.) 29
18. Suppose a 5.5 foot human has the same jumping ability of a frog. If a 0.2 feet long frog can jump 17.5 feet, how far could this person jump?
- a.) 96.25 ft                      b.) 48.125 ft                      c.) 481.25 ft                      d.) 17.5 ft
19. Four consecutive odd numbers has a sum of 504. What is the median of the numbers?
- a.) 126                      b.) 125                      c.) 123                      d.) 127
20. What is the mean of the following numbers: 76, 34, 78, and 56
- a.) 244                      b.) 61                      c.) 49                      d.) 56
21. How many possible ways could Western Montana College, Montana Tech, Carroll College, Rocky Mountain College, and MSU Northern finish in the Frontier football conference?
- a.) 120                      b.) 15                      c.) 5                      d.) 50
22. After school, Dave makes paperweights out of driftwood, and a gift store sells them for \$17.95 a set. If Dave receives a 40% commission on every sale, how much does he make if two sets are sold?
- a.) \$7.18                      b.) \$14.00                      c.) \$8.00                      d.) \$14.36
23. How many whole-number factors of 36 are divisible by 2?
- a.) 5                      b.) 6                      c.) 7                      d.) 8
24. The product of a positive number and its reciprocal is always
- a.) prime                      b.) even                      c.) 0                      d.) 1

## Number Concepts 2011 Answer Key

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