



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2016 MATH CONTEST
Number Concepts

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

.....

- On a map 2 cm represents 50 km. The distance between two towns on this map is 7.5 cm. Their actual distance apart is:
A) 375 km B) 275 km C) 187.5 km D) 75 km E) None of these
- If low-fat yogurt has 25% fewer calories than regular yogurt, and if the container of low-fat yogurt has 180 calories, then the same-sized container of regular yogurt contains how many calories?
A) 135 B) 205 C) 225 D) 240 E) None of these
- Which ratio is equivalent to a unit rate of $\frac{1}{4}$ cup of milk per cup of flour?
A) $\frac{1}{2}$ cup of milk per $1\frac{3}{4}$ cup flour B) $1\frac{1}{2}$ cup milk per 4 cups flour
C) $1\frac{3}{4}$ cup milk per 7 cups flour D) $\frac{3}{4}$ cup milk per $1\frac{1}{2}$ cup flour
E) None of these
- The standard dose of an antibiotic is 4 cc for every 25 pounds of body weight. At this rate, find the standard dose for a 140 pound woman.
A) 22.4 cc B) 875 cc C) 5.6 cc D) 22.8 cc E) None of these
- Solve this equation for x: $15/(3x-4) = 5/x$
A) 0 B) No solution C) 15 D) 11 E) None of these
- Two out of every five men blame their poor eating habits on too much fast food. In a room of 40 men, how many would you expect to blame their poor eating on fast food?
A) 8 B) 10 C) 16 D) 18 E) None of these
- Simplify $6^2 + 2(3-5) \div 2$
A) 16 B) 18 C) 18.5 D) 34 E) None of these
- Evaluate $(3x+5)/(-2y)$ when $x = -5$ and $y = 5$
A) -1 B) 0 C) 1 D) 2 E) None of these
- What is the next number in the sequence: 1, 1, 2, 3...
A) 3 B) 5 C) 6 D) 9 E) None of these
- Simplify the following expression: $(120 + 7a + 12b) - (220 + 2b - 5a - c)$
A) $-100+12a+10b+c$ B) $-100+2a+10b-c$ C) $-100+2a+14b+c$
D) $100+12a+10b+c$ E) None of these
- Kim spent \$61 on a dress. This was \$15 more than twice what she spent for a pair of pants. How much was the pair of pants?
A) \$21 B) \$22 C) \$23 D) \$24 E) None of these
- If a computer is originally priced at \$750 and goes on sale for 30% off and you have a coupon for 10% off the discounted price, how much do you pay for the computer?
A) \$450 B) \$472.50 C) \$462.50 D) \$425 E) None of these

NUMBER CONCEPTS 2016 page 2

Use the following information for questions 13-15. Derrick's Dog Sitting Service charges \$12 plus \$5 per hour. Darlene's Dog Sitting Service charges \$18 plus \$3 per hour.

13. How much would it cost you to board your dog with Derrick for 5 hours?
A) \$37 B) \$65 C) \$17 D) \$32 E) None of these
14. If you only have \$40 how long, to the nearest hour, could you board your dog with Darlene?
A) 6 hours B) 7 hours C) 8 hours D) 9 hours E) None of these
15. At how many hours will the two prices be the same?
A) 12 hours B) 4 hours C) 15 hours D) 3 hours E) None of these
16. What is the sum of all the whole number factors of 24?
A) 24 B) 48 C) 36 D) 60 E) None of these
17. What is the prime factorization of 96?
A) $2^5 \cdot 3$ B) $2^4 \cdot 3$ C) $2^4 \cdot 6$ D) 2^6 E) None of these
18. A worker's daily salary is increased from \$40 to \$50. What is the percent of increase?
A) 50% B) 25% C) 20% D) 10% E) None of these
19. Solve for m: $(\frac{2}{11})m + 16 = 4 + (\frac{6}{11})m$
A) $16 \frac{1}{2}$ B) $27 \frac{1}{2}$ C) 33 D) 55 E) None of these
20. Solve for p: $-0.75p - 2 = 0.25p$
A) -2 B) 2 C) -4 D) 4 E) None of these
21. You went to dinner and your bill came to \$42.60 and you want to leave a 15% tip. How much are you going to pay altogether?
A) \$6.39 B) \$36.21 C) \$45.99 D) \$48.99 E) None of these
22. What two whole number positive integers is the square root of 152 between?
A) 12,13 B) 13,14 C) 152,153 D) 153,154 E) None of these
23. What is the next number in the sequence: 1, 4, 9, 16...
A) 32 B) 21 C) 36 D) 25 E) None of these
24. On a movie screen a dog is 6 feet tall, while in real life the dog is 2 feet tall. If a man in real life is $5 \frac{3}{4}$ feet tall, how tall is he on the movie screen?
A) $17 \frac{1}{4}$ B) 21 C) $15 \frac{3}{4}$ D) 25 E) None of these
25. A store manager buys Pop-Tarts for \$2 per box. If the store manager then marks the price up by 175%, how much does the customer pay for one box of Pop-Tarts?
A) \$4 B) \$4.25 C) \$5.50 D) \$5.75 E) None of these
26. Solve for y: $2y-5=-3y+15$
A) 12 B) 20 C) 2 D) 4 E) None of these

Number Concepts 2016 Answer Key

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