



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2015 MATH CONTEST
TEAM 9-10

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

- In a school of 100 students, 90 study English, 75 study Spanish, and 42 study French. Every student must study at least one of the three languages. What is the least possible number of students who could be studying all three languages?
A) 7 B) 15 C) 33 D) 0 E) None of these
- Frank has \$1.85 in dimes and quarters. Find all possibilities for the number of dimes that he has.
A) 1, 3, 5, or 7 B) 7 or fewer C) 1, 6, 11, or 16 D) 18 or fewer E) None of these
- At the Belltower School, 99% of the 100 students are girls, but only 98% of the students in grade 8 are girls. Which of the following is the number of students in grade 8 who are girls?
A) 98 B) 97 C) 49 D) 48 E) None of these
- The lengths of the three sides of a right triangle are consecutive multiples of three. What is the area of the triangle?
A) 108 B) 54 C) 36 D) 90 E) None of these
- In 1903, the first Tour de France had 60 riders. In 2005, the tour had grown to 154 riders. What is the percent of increase in its 103-year history (to the nearest percent)?
A) 61% B) 194% C) 54% D) 157% E) None of these
- My cat Boots has $5x$ upper teeth and $3y$ lower teeth. If Boots has the same number of upper and lower teeth, then $x : y =$ _____.
A) 3:5 B) 5:3 C) 8:5 D) 3:8 E) None of these
- In a pre-election poll of 480 voters, 260 favoured candidate Harrison. How many of an anticipated 12,000 votes is Harrison likely to get?
A) 6000 B) 6500 C) 7000 D) 7500 E) None of these
- Triangle ABC has vertices $A(1,0)$, $B(0,-2)$, and $C(3,-3)$. If triangle ABC is rotated 90° counter clockwise about A, what are the coordinates of the image of C?
A) $(-1, 3)$ B) $(-2, -2)$ C) $(-3,-3)$ D) $(4,2)$ E) None of these
- Sara has \$36 in \$1, \$5, and \$10 bills. She has the same number of \$5 bills as \$10 bills, and she has 10 bills in all. How many bills of each denomination does she have?
A) 8 – \$1, 1 – \$5, 1 – \$10 B) 6 – \$1, 2 – \$5, 2 – \$10 C) 4 – \$1, 3 – \$5, 3 – \$10
D) 2 – \$1, 4 – \$5, 4 – \$10 E) None of these
- You invest \$4000 earning 6% compounded yearly. After 2 years, what are your earnings?
A) \$452.40 B) \$254.40 C) \$120.40 D) \$462.80 E) None of these

11. A car radiator has a 16-quart capacity and is currently filled with 40% antifreeze solution. How many quarts of this solution should be drained off and replaced with 100% antifreeze to obtain a 50% antifreeze solution?
 A) $\frac{8}{3}$ B) $\frac{4}{3}$ C) 8 D) 4 E) None of these
12. A circle and a square have equal areas. The ratio of the length of a side of the square to the length of the diameter of the circle is _____.
 A) $\sqrt{\pi} : 1$ B) $2\sqrt{\pi} : 1$ C) $\sqrt{\pi} : 2$ D) $1 : \sqrt{\pi}$ E) None of these
13. Find 5% of 6%.
 A) 0.03% B) 0.11% C) 0.3% D) 3% E) None of these
14. Three vertices of a parallelogram are at (2, 1), (-1, -3), and (6, 4). Which of the following could be the coordinates of the remaining vertex?
 A) (0, 3) B) (3, 0) C) (-1, 4) D) (6, 1) E) None of these
15. The half-life of iodine-124 is 4 days. What part of the mass is left after sixteen days?
 A) 1/8 B) 1/4 C) 1/2 D) 1/16 E) None of these
16. You and your five friends attend a concert. Your tickets are for the same row and are numbered consecutively. How many different ways can all of you sit in the assigned seats?
 A) 6 B) 100 C) 120 D) 360 E) None of these
17. Ara and Shea were once the same height. Since then Shea has grown 20% while Ara has grown half as many inches as Shea. Shea is now 60 inches tall. How tall, in inches is Ara now?
 A) 48 in B) 51 in C) 52 in D) 54 in E) None of these
18. Starting with January, number the months from 1 to 12. How many of the odd-number months have an even number of days?
 A) 1 B) 2 C) 3 D) 4 E) None of these
19. Two distinct intersecting lines intersect at
 A) 1 point B) 2 points C) 3 points D) 4 points E) an infinite number of points
20. Solve: $(3x + 2)(x - 3) = 7x - 1$
 A) {5, 4} B) {-1/3, 4} C) {5, 1/3} D) {-1/3, 5} E) None of these
21. If the operation # is defined by the equation $x \# y = 2x + y$, what is the value of **a** in the equation $2 \# a = a \# 3$?
 A) -4 B) -1 C) 0 D) 1 E) None of these
22. Weather statistics show that for the last 10 years the probability of rain on any given day in May is 38%. What is the probability that it will not rain on your May Day (May 1) parade?
 A) 38% B) 28% C) 32% D) 62% E) None of these

TEAM 9-10 2015 Answer Key

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