



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2013 MATH CONTEST
PROBLEM SOLVING TEST

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

- The probability of drawing a blue M&M candy out of a standard bag is $\frac{1}{12}$. The probability of drawing a green M&M out of the same bag is $\frac{1}{4}$. What is the probability of pulling one blue and one green when you pull two random pieces of candy out of a standard bag?
A) $\frac{1}{16}$ B) $\frac{1}{3}$ C) $\frac{1}{8}$ D) $\frac{1}{48}$
- You have tormented your PE teacher all school year. You just released a zombie from the closet next to the locker room. The zombie plods along at 4 mph. Twelve minutes earlier, your injured PE teacher ran screaming from the gym at a speed of 3 mph. How long does it take for the zombie to catch your teacher?
A) 1 hour B) 36 minutes C) 1 hour 20 min D) 45 minutes
- Multiply. Express your answer in scientific notation.
 $(7.2 \times 10^{-6})(3.6 \times 10^{-2})$
A) 25.92×10^{12} B) 2.592×10^{13} C) 2.592×10^{-7} D) 2.592×10^{-6}
- At the beginning of 2013, Hayden purchases a new 2013 Ford Mustang convertible for \$27,200. The annual depreciation rate is 14%. How much will Hayden's Mustang be worth at the end of 2017?
A) \$52,371.28 B) \$14,878.62 C) \$11,004.23 D) \$12,795.61
- The first four terms of an arithmetic sequence are 8, 5, 2, -1. What is the 50th term in the sequence?
A) -136 B) -139 C) -142 D) -145
- The first term in a geometric sequence is 8. The fourth term in the same sequence is 1. What is the common ratio of this sequence?
A) 8 B) 2 C) $\frac{1}{2}$ D) $\frac{1}{8}$
- Let $A = \begin{bmatrix} 2 & -1 & -3 \\ 0 & 6 & 5 \end{bmatrix}$. Let $B = \begin{bmatrix} 7 & 2 \\ -4 & 1 \\ 3 & -2 \end{bmatrix}$. Find $A - B$.
A) Not possible. B) $\begin{bmatrix} -5 & 3 & -6 \\ -2 & 5 & 7 \end{bmatrix}$ C) $\begin{bmatrix} -5 & -2 \\ 3 & 5 \\ -6 & 7 \end{bmatrix}$ D) $\begin{bmatrix} 5 & -3 & 6 \\ 2 & -5 & -7 \end{bmatrix}$
- If Sofie is sick, then she will be absent from school. If Sofie is absent, then she will miss her classwork. What can you conclude?
A) If Sofie is sick, then she will miss her classwork. C) If Sofie misses her classwork, then she is absent.
B) If Sofie is absent, then she is sick. D) If Sofie misses her classwork, then she is sick.

PROBLEM SOLVING 2013 Answer Key

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