



MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2013 MATH CONTEST
INTERMEDIATE TEST

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

- James added a new picture to his Facepage. He then sent it to five of his friends. Each of the recipients sent it to five of their friends, and they each sent it on to five more friends. Assuming no one got the picture more than once, how many people received the picture?
(A) 15 (B) 125 (C) 150 (D) 155
- Will works 20 hours a week as a fry cook at Mooby's. He gets paid \$7.50 per hour. After six weeks, how much money should Will make?
(A) \$900 (B) \$150 (C) \$720 (D) \$1200
- Betty is an Olympic diver. She receives scores of 7.8, 8.2, 7.9, 8.4 and 8.2 from her first five dives. What does she need to get on her sixth dive to have a mean of exactly 8.1?
(A) 8 (B) 8.1 (C) 8.7 (D) 0
- Which expression is not equal to $x^2 + 6x + 9$?
(A) $(x + 3)^2$ (B) $(x - 3)^2$ (C) $(x + 2)(x + 4) + 1$ (D) $x^2 + 3(2x + 3)$
- Find the slope of the line $3y = 4 - 2x$
(A) $-\frac{2}{3}$ (B) -2 (C) -1.5 (D) $\frac{2}{3}$
- The height of a fly ball (in meters) is defined by the equation $h(t) = -4.9t^2 + 24.5t + 1$, where t is number of seconds after the ball was hit. What is the maximum height of the ball?
(A) 2.5 meters (B) 24.5 meters (C) 1.625 meters (D) 31.625 meters
- The force in newtons needed to open a door is inversely proportional to the distance in centimetres from the hinge. For a heavy freezer door, the constant of variation is 900 N-cm. What is the force needed to open the door by pushing at a point 15 cm from the hinge?
(A) 60 N (B) 13500 N (C) 885 N (D) 915 N
- If $0 < a < 1$, which expression is the smallest?
(A) $-2a$ (B) $-0.5a$ (C) $2a$ (D) $0.5a$
- Total cost of gasoline and the amount of gasoline purchased vary directly. If 8 gallons cost \$27.99, how much will 13 gallons cost (to the nearest cent)?
(A) \$3.49 (B) \$37.16 (C) \$45.49 (D) \$17.50

10. Below are the points scored in last night's basketball game. Who is an outlier (if any)?

Player	Points scored
BeLron Jim	33
Devin Kurant	15
Boke Ryant	20
Barlos Cooser	8
Teve Snash	12
Bane Hattier	14
Lake Riffin	11

- (A) No outliers (B) BeLron and Boke (C) BeLron only (D) Barlos only

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11. Which of the following is NOT a solution of the inequality $4y < 2x - 3$
A) (3,0) B) (5.5, 2) C) (0, -2) D) (11, 4)
12. Find the value of x for the solution to the system:
$$\begin{cases} y = 4x - 1 \\ y = 5x - 9 \end{cases}$$

A) 0 B) 8 C) 10 D) -10
13. If a horizontal line is intersected by 100 distinct vertical lines, into how many non-overlapping pieces is the horizontal line separated?
A) 200 B) 101 C) 100 D) 99
14. Travis Pastrami drives 480 kilometers in 1.5 hours. How fast is Travis going in meters per second?
A) 320 m/s B) 5333.3 m/s C) 88.9 m/s D) 5.3 m/s
15. Mr. Descartes calculates his semester grades using the table below.

First Quarter	40%
Second Quarter	40%
Semester Exam	20%

- If Leonhard gets 83% first quarter and 91% second quarter, what must he get on the semester exam to get 80% for the semester?
A) 52% B) 62% C) 72% D) 82%
16. 10 American dollars are worth 8 Euros. 5 Euros are worth 4 British pounds. 6 British pounds are worth 540 Indian rupees. How many Indian rupees are 20 American dollars worth?
A) 1152 rupees B) 892 rupees C) 0.3 rupees D) 548 rupees
17. Consider the sequence -1, 5, 11, 17, 23,... What is the value of the 50th term of the sequence?
A) 300 B) 293 C) 230 D) 49
18. Find the equation of the line that goes through the points (5, 3) and (5, 8).
A) $y = 1x$ B) $y = 5x$ C) $y = 5$ D) $x = 5$
19. Where does the graph of $y = 4x^2 - 41.2x + 89.28$ cross the x-axis?
A) (3.1, 0) B) (0, 3.1) and (0, 7.2) C) (3.1, 0) and (7.2, 0) D) (0, 3.1)
20. Find all possible values for a if $8 \geq -3a - 7$.
A) $a \geq -5$ B) $a \leq -5$ C) $a \geq -\frac{1}{3}$ D) $a \leq -\frac{1}{3}$

Use for Problems 21-22.

Keep It Classy Limo Service has a flat fee to rent a limo, then charges by the hour of use. Last year you had a limo for 4 hours and were charged \$343. This year you rented the limo for 6 hours and were charged \$487.

- 21) How much is the flat fee?
A) \$72 B) \$144 C) \$85.75 D) \$55
- 22) How much is the hourly rate?
A) \$72 B) \$144 C) \$85.75 D) \$55
- 23) F varies jointly with x and y . F is 24 when x is 2 and y is 3. What is y if F is 0.5 and x is 1?
A) 8 B) 48 C) 0.5 D) 0.125

INTERMEDIATE 2013 Answer Key

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