

**MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2014 MATH CONTEST**

Dimensions and Shapes

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

1. Zoie's cornfield is a rectangle that is 64 yards wide. The length of the field is twice the width. How much fencing does he need to go around the field?
A) 256 yards B) 384 yards C) 400 yards D) 4096 yards E) None of these
2. A sail is shaped like an isosceles triangle. The short side is 11 feet long and is half the length of the longer sides. The sail has holes for rope spaced one foot apart around the perimeter. How many holes are around the sail?
A) 54 B) 55 C) 56 D) 58 E) None of these
3. Shaniqua enjoys longboarding. The diameter of the wheels on her new longboard is 72 mm. About far does she travel when her wheel makes one complete turn?
A) 22.6 cm B) 36 cm C) 360 cm D) 720 cm E) None of these
4. Ray Kozak set a world record for spinning the largest rodeo loop. If the loop was 86 feet in circumference, what would its approximate area be?
A) 135 feet² B) 270 feet² C) 589 feet² D) 14792 feet² E) None of these
5. An average student can fit in a space 2 feet long by 1 foot wide by 5 feet high. How many students could be stuffed into a classroom that is 36 feet long, 28 feet wide, and 9 feet high? (Assume all space is filled)
A) 90 B) 907 C) 908 D) 1000 E) None of these
6. Which of the following side lengths can form a right triangle?
A) 1, 3, 4 B) 7, 8, 15 C) 9, 12, 15 D) 12, 2, 24 E) None of these

Use the following picture to answer the following questions about Betsy and Tony's house.

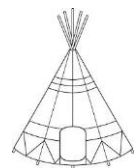
7. Contractors are finishing the house this summer, but first they have to insulate the 10 foot high exterior walls. Insulation costs \$17.79 for a roll that is 25 feet by 16 inches. How much will it cost to insulate the exterior walls? Include insulation to cover the exterior doors and windows.
A) \$456.97 B) \$512.35 C) \$515.91
D) \$693.81 E) None of these



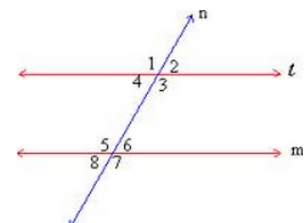
8. Betsy is carpeting her living room this weekend. How many square feet of carpeting will she need to buy?
A) 108ft² B) 144ft² C) 168ft²
D) 180ft² E) None of these
9. Next fall, she will be tiling her kitchen. Each tile is 9x9 inches. How many tiles will she need?
A) 16 B) 90 C) 108 D) 192 E) None of these
10. If typical construction costs \$125 per square foot of floor space, what is the total cost of this building if there is a second level of equal square footage?
A) \$576 B) \$1152 C) \$72000 D) \$144000 E) None of these

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11. The back yard of Betsy's house has a round hot tub with a radius of 5 feet. What is the approximate area of the ground that the hot tub covers?
 A) 15.7ft^2 B) 31.4ft^2 C) 78.5ft^2 D) 314ft^2 E) None of these
12. Betsy's husband Tony is going to fill their hot tub. The interior space is cylindrical in shape with a radius of 4.5 feet and a height of 3.5 feet. About how much water will he need if he fills the hot tub up with water 6 inches from the top?
 A) 127.12ft^3 B) 153.34ft^3 C) 222.55ft^3 D) 324.35ft^3 E) None of these
13. Ben's school is a rectangle that is 200 feet wide and 300 feet long. He wants to wrap a ribbon around the building. How much ribbon should he buy?
 A) 250 ft B) 500 ft C) 750 ft D) 1000 ft E) None of these
14. Pat wants to buy enough paint to paint his room. His room is 12 feet by 14 feet and has 8 foot ceiling. If he wants to paint all four walls and the ceiling, how many quarts of paint should he buy? (one quart covers about 250 square feet)
 A) 1 B) 2 C) 3 D) 4 E) None of these
15. Rosy wants to buy trim to go around her door and window in her bedroom. It is sold by the linear foot and she must go all around her window and on the sides and top of her door. How much trim should she buy if her door is 30 inches wide and 70 inches tall and the window is a square four feet on each side?
 A) about 11ft B) about 21 ft C) about 31 ft D) about 41 ft E) about 51 feet
16. Farmer Nicole has 15 very rare prized chickens. She takes her chickens to market, and trades her very rare chickens for 9 endangered species ducks. When walking home from the market, she walks past Molly's Moo-Cow farm, and decides to trade her 9 endangered ducks for 1 cow. After learning how stinky cows are, she decides to trade the cow for 4 billy goats. Her billy goats eat her prized quilt, so she trades her 4 billy goats for 1 hog that weighs 180 lbs, which she takes to the slaughterhouse. She receives \$2.75 per pound for her pig. Assuming all trades were fair, how much is a rare prized chicken worth?
 A) \$4.70 B) \$8.80 C) \$13.78 D) \$20.37 E) None of these
17. Thomas is constructing a tepee this weekend to go camping with his whole family. The diameter of the canvas of tepee is 26 feet and it is 32 feet high from the center of the tepee to the top of the canvas. If he wants to place 1 pole approximately every 3 feet apart, about how many poles will he need?



- A) 27 poles B) 29 poles C) 32 poles D) 33 poles E) None of these
18. If each pole will stick out of the top of the canvas 2 feet, approximately how long should each pole be?
 A) 32.5 feet B) 34.5 feet C) 36.5 feet D) 38.5 feet E) None of these
19. Use the diagram to the right. The measure of angle 1 is 112° . Find the measure of angle 5.
 A) There is not enough information. B) 112°
 C) 108° D) 116° E) None of these



20. Use the diagram to the right. The measure of angle 1 is 112° . Find the measure of angle 6.
 A) There is not enough information B) 112°
 C) 60° D) 69° E) None of these

2014 DIMENSIONS AND SHAPES ANSWER KEY

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