

MONTANA COUNCIL OF TEACHERS OF MATHEMATICS
2015 MATH CONTEST

Dimensions and Shapes

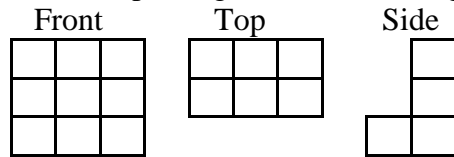
DIRECTIONS: DO NOT WRITE ON THIS TEST. Place the best answer for each question on the separate answer sheet.

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- The height of Mrs. Fix's tablet screen measures 10.2 inches and its width is 7 inches. What is the approximate measure of its diagonal?
A) 153.04 inches B) 12.4 inches C) 17.2 inches D) 7.41 inches E) none of these
- Find the area of a trapezoid with a height of 8 meters and bases of 18 meters and 10 meters.
A) 130 m^2 B) 36 m^2 C) 224 m^2 D) 112 m^2 E) none of these
- Usain Bolt ran the 100 m dash in 2009 in 9.58 seconds. Convert this to kilometers per hour.
A) 0.63 km/hr B) 375.78 km/hr C) 37.58 km/hr D) 0.27 km/hr E) none of these
- You are helping pour a concrete sidewalk which is 4 feet wide, 12 feet long, and 4 inches deep. How many cubic yards of concrete do you need?
A) 0.6 yd^3 B) 16 yd^3 C) 192 yd^3 D) $5 \frac{1}{3} \text{ yd}^3$ E) none of these
- If concrete costs \$4.14 per square foot, how much will it cost to pour your new 30 feet by 30 feet basketball court in your back yard?
A) \$217.39 B) \$248.40 C) \$3414 D) \$3726 E) none of these
- A size 5 soccer ball has a circumference of 28 centimeters. What is its approximate diameter?
A) 4.5 cm B) 8.9 cm C) 9.3 cm D) 17.8 cm E) none of these
- A triangle's area is 15 m^2 , and its base is 5 m. What is the height of the triangle?
A) 6 m B) 12 m C) 3 m D) 37.5 m E) none of these
- Paint is purchased to paint the 8 foot high walls and the ceiling of a bedroom which is 12 feet by 15 feet. If a gallon of paint covers 350 square feet, how many gallons of paint should you purchase?
A) 3 B) 1 C) 4 D) 2 E) none of these
- Floor tiles that will be laid in a 7 ft by 12 ft bathroom measure 9 inches by 9 inches. How many tiles must be purchased to complete the job?
A) 150 B) 103 C) 300 D) 149 E) none of these
- How much fence is needed to enclose a dog pen 10 feet by 5 feet if the garage is used as one of the short sides of the pen?
A) 15 feet B) 50 feet C) 30 feet D) 25 feet E) none of these
- A plan for a skateboard ramp calls for a height of 1.625 feet. What would this be on a tape measure?
A) 1 ft $7 \frac{1}{2}$ in B) 1 ft 6 inches C) 1 ft $6 \frac{1}{4}$ inches D) 1.6 inches E) none of these
- What are the coordinates of the point (-5, 7) when it is reflected across the y-axis?
A) (-5, -7) B) (5, -7) C) (5, 7) D) (7, -5) E) none of these

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13. Find the volume of this prism given the following views:



- A) 9 cubic units B) 19 cubic units C) 4 cubic units D) 12 cubic units E) none of these
14. If a square has an area of 49 sq cm, what is its perimeter?
 A) 7 cm B) 98 cm C) 28 cm D) 14 cm E) none of these
15. Water weighs 0.036 pounds per cubic inch. If an aquarium is 1 foot by 6 in. by 8 in., how much does the water in the aquarium weigh?
 A) 20.736 pounds B) 1.728 pounds C) .012 pounds
 D) 16,000 pounds E) none of these
16. How long would it take a runner to complete a 26.2 mile marathon if she averaged 6 miles per hour?
 A) 4 hours 22 minutes B) 3 hours C) 2 hours 37 minutes
 D) 6 hours E) none of these
17. How many 3 in. by 3 in. by 3 in. cubes will it take to build a 6 in. by 9 in. by 3 in. rectangular solid?
 A) 135 B) 27 C) 15 D) 5 E) none of these
18. You want to put a wood border around the floor of a bedroom which measures 10 feet by 14 feet. If the bedroom has two 2'6" doors that don't require the border, how many total feet of border are needed?
 A) 135 ft B) 48 ft C) 43 feet D) 19 feet E) none of these
19. A 20 ft by 40 ft backyard pool is surrounded by a 3 foot walkway. What is the area of the walkway?
 A) 800 ft² B) 360 ft² C) 396 ft² D) 180 ft² E) none of these
20. Find the surface area of a 12 cm by 9 cm by 11 cm rectangular prism.
 A) 339 cm² B) 678 cm² C) 1188 cm² D) 32 cm² E) none of these
21. The High Roller Ferris Wheel in Las Vegas is 550 feet tall. A 30-minute ride is one revolution. How fast is the ride?
 A) 57.6 ft/sec B) 1 ft/sec C) 10 ft/sec D) 0.48 feet per second E) none of these
22. There are 28 cars on the High Roller Ferris Wheel. What is the central angle between each car?
 A) 26° B) 62° C) 6° D) 13° E) none of these
23. One endpoint of the diameter of a circle is (5,12). The center of the circle is (3,-5). Find the other endpoint of the diameter.
 A) (-3,-15) B) (1,-15) C) (-2,-15) D) (-1,-22) E) none of these
24. Thomas the T-rex, the centerpiece of Dinosaur Hall at the Natural History Museum in Los Angeles, was excavated in Carter County, Montana. If ¼ inch = 1 foot in a scale drawing, and the T-rex is 8.5 inches in the drawing, how long is Thomas?
 A) 34 feet B) 2.125 feet C) 68 feet D) 340 feet E) none of these

Dimensions & Shapes 2015 Answer Key

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