

Kansas City Area Teachers of Mathematics
2018 KCATM Math Competition

GEOMETRY AND MEASUREMENT TEST
GRADE 6
#51-90

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.
- Time limit: **20 minutes**
- Mark your answer on the answer sheet by **FILLING in the oval**.
- You **may** use calculators.
- For pi, use the π key or 3.14159 on your calculator.
- You **may not** use rulers, protractors, or other measurement devices on this test.
- Letter “E” is “**None of the above**” or “**Not given**”. It may be the correct answer to some of the problems.
- The **figures are not to scale**.

Area Formulas:

Triangle	$A = \frac{bh}{2}$
Parallelogram	$A = bh$
Trapezoid	$A = \frac{h(b_1 + b_2)}{2}$

Volume Formulas:

Rect. Prism	$V = lwh$
Cylinder	$V = \pi r^2 h$

Student Name _____ Student Number _____

School _____

51. Which statement is true?

- A. One line segment can divide a hexagon into two smaller hexagons.
- B. One line segment can divide a triangle into two smaller triangles.
- C. One line segment can divide a square into two smaller squares.
- D. One line segment can divide a circle into two smaller circles.
- E. None of the above.

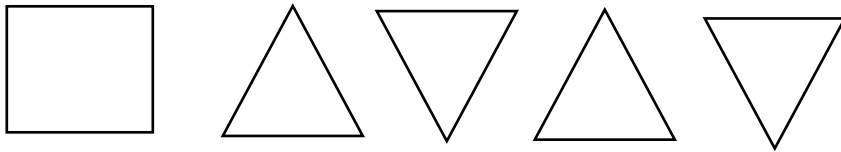
52. Which shape is possible?

- A. A rhombus with 4 acute angles.
- B. A parallelogram with 4 angles of equal measure.
- C. A rhombus with sides that measure 4cm, 4cm, 8 cm, and 8cm.
- D. A parallelogram with sides that measure 2cm, 4cm, 6cm, and 8cm.
- E. None of the above.

53. Juan made cones and cylinders out of paper. He cut a total of 10 circles for the bases. Juan made 4 cones. How many cylinders did he make?

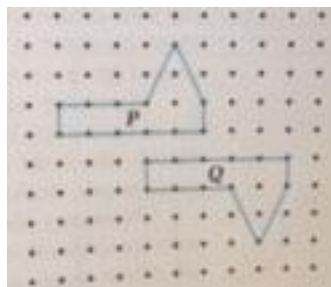
- A. 1 B. 2 C. 3 D. 6 E. Not given

54. The shapes below are five faces of a three-dimensional figure. What is the three-dimensional figure?



- A. Cube B. Cone C. Prism D. Pyramid E. Not given

55. Look at figures P and Q. Which motion or motions will result in Figure P exactly covering Figure Q?

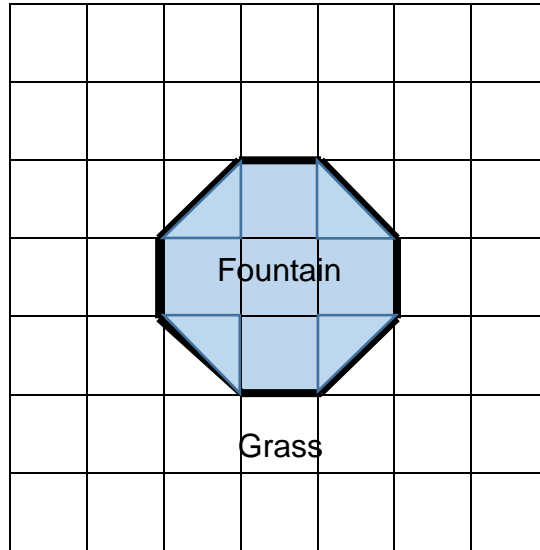


- A. Slides only
- B. Turns only
- C. Flips and turns only
- D. Flips and slides only
- E. None of the above

56. Maria drew a rectangle with the following properties: (a) the area is 32 square centimeters and (b) the length is twice the width. What is the perimeter of Maria's rectangle?

- A. 12cm B. 16cm C. 24cm D. 36cm E. Not given

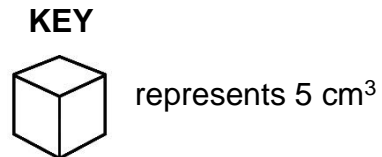
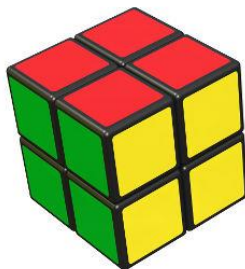
57. Look at the picture. 1 square represents 1 square foot. What is the area of the grass around the fountain?



1 square = 1 square foot

- A. 46 ft² B. 44 ft² C. 42 ft² D. 40 ft² E. Not given

58. Look at the solid below. What is the **volume** of the solid?



- A. 8cm³ B. 20cm³ C. 40cm³ D. 60cm³ E. None of these

59. What is the **surface area** of the solid pictured in #58?

- A. 20cm² B. 24cm² C. 300 cm² D. 600cm² E. Not given

60. Which of the following words has **line symmetry**?

- A. MODE B. HOSE C. CONE D. NOSE E. Not given

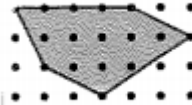
61. Which regular polygon has 60° rotational symmetry?

- A. triangle
- B. square
- C. pentagon
- D. hexagon
- E. None of the above

62. Which of the following is true?

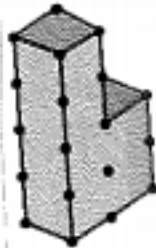
- A. All rectangles are squares.
- B. All rhombi are squares
- C. Some rhombi are rectangles.
- D. Some squares are rhombi.
- E. None of the above

63. What is the **area** of the irregular polygon pictured below?



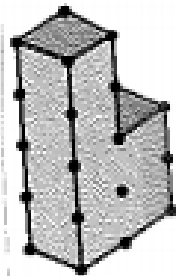
- A. 12 units²
- B. 11 units²
- C. 10 units²
- D. 9 units²
- E. Not given

64. What is the **surface area** of the figure below?

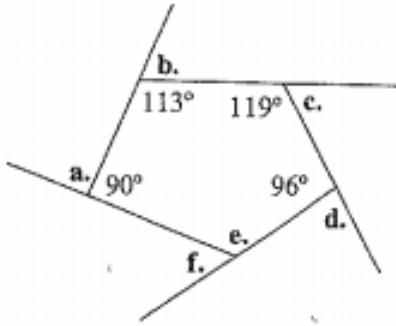


- A. 15 units²
- B. 19 units²
- C. 22 units²
- D. 24 units²
- E. Not given

65. What is the **volume** of the figure below?



- A. 8 units³
- B. 7 units³
- C. 6 units³
- D. 5 units³
- E. Not given



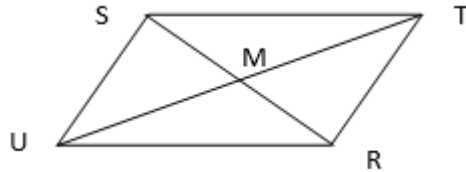
66. What is the measure of **angle “e”** in the figure?

- A. 121° B. 120° C. 119° D. 118°
- E. None of the above

67. What is the measure of **angle “c”** in the figure?

- A. 45° B. 61° C. 84° D. 60°
- E. None of the above

68. Describe a transformation that would map segment ST onto segment RU.

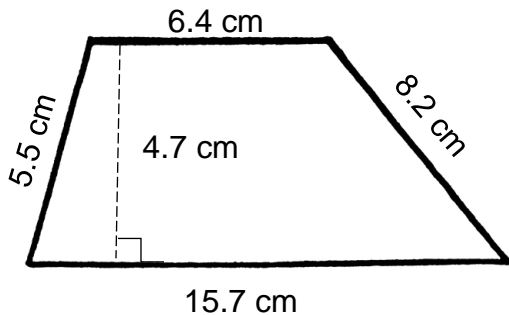


- A. A reflection across a horizontal line through point M
- B. A translation along the height of parallelogram STRU
- C. A translation along segment SU
- D. A 180 degree rotation clockwise about point M
- E. None of the above

69. How many lines of reflection are in parallelogram STRU (the parallelogram in #68)?

- A. 3 B. 2 C. 1 D. 0 E. Not given

70. What is the **area** of the trapezoid below?

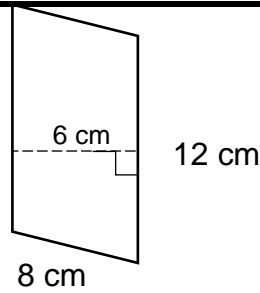


- A. 60.8 cm^2 B. 43.8 cm^2 C. 51.9 cm^2 D. 103.9 cm^2 E. Not given

71. What is the **perimeter** of the trapezoid pictured in #70?

- A. 35.8 cm B. 35.8 cm^2 C. 40.5 cm D. 40.5 cm^2 E. Not given

72. What is the area of the figure below?

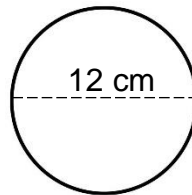


- A. 72 cm^2 B. 48 cm^2 C. 36 cm^2 D. 24 cm^2 E. Not given

73. What is the **perimeter** of the parallelogram in #72?

- A. 26 cm B. 40 cm C. 46 cm D. 52 cm E. Not given

74. What is the **area** of the circle pictured?

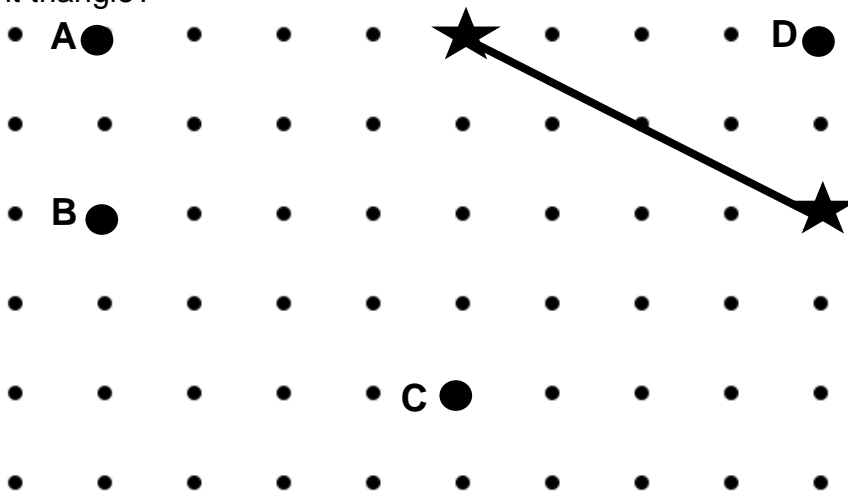


- A. $144\pi \text{ cm}^2$ B. $12\pi \text{ cm}^2$ C. $24\pi \text{ cm}^2$ D. $36\pi \text{ cm}^2$ E. Not given

75. What is the circumference of the circle in #74?

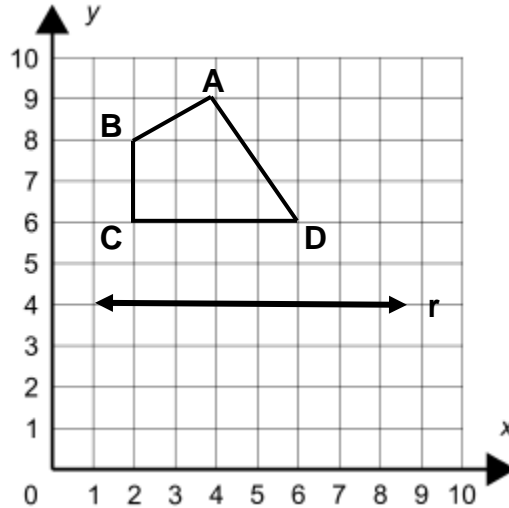
- A. $144\pi \text{ cm}$ B. $12\pi \text{ cm}$ C. $24\pi \text{ cm}$ D. $36\pi \text{ cm}$ E. Not given

76. Marcy is drawing a right triangle by placing stars on the grid below and connecting them with line segments. Which point could be the location of a third star of Marcy's right triangle?



- A. Point A B. Point B C. Point C D. Point D E. Not given

77. The image below shows quadrilateral ABCD and a line of reflection. Determine the coordinate of A' .



- A. (4, -1) B. (-1, 4) C. (-9, 4) D. (4, -9) E. Not given

78. Rotate the quadrilateral in #77 **ninety degrees clockwise about point C**. What is the coordinate of B' ?

- A. (5, 8) B. (2, 2) C. (2, 4) D. (4, 6) E. Not given

79. Jeff bought 6 quarts of juice for a party. One glass holds 8 fluid ounces of juice. What is the total number of glasses Jeff can fill with the juice he bought? [1 quart = 32 fluid ounces]

- A. 24 B. 48 C. 16 D. 12 E. Not given

80. Mr. Randall's class is making puppets. Each puppet needs 60 centimeter or string. How many puppets can Mr. Randall's class make from 12 meters of string?

- A. 20 B. 50 C. 200 D. 500 E. Not given

81. The endpoints of a line segment are the points with coordinates (2, 1) and (8, 9). What are the coordinates of the midpoint of this line segment?

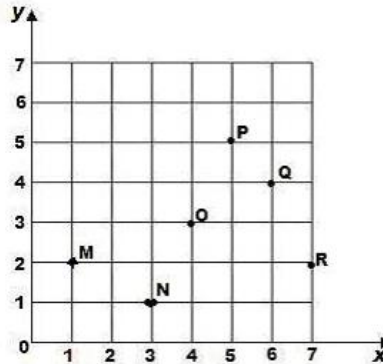
- A. (2, 3.5) B. (3, 4) C. (5, 5) D. (4.5, 5.5) E. Not given

82. The complement of an angle that measures 40° must have a measure of

- A. 60° B. 30° C. 50° D. 40° E. Not given

83. Identify the point on the grid below that corresponds to the ordered pair (6, 4).

- A. Point M
- B. Point N
- C. Point O
- D. Point P
- E. None of the above



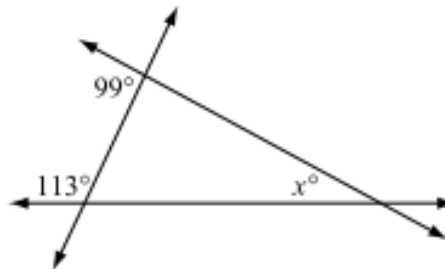
84. A museum has an aquarium the shape of a right rectangular prism that is 22.9 meters long, 7.5 meters wide, and 4.6 meters high. What is the volume, rounded to the nearest cubic meter, of the aquarium?

- A. 280
- B. 623
- C. 790
- D. 1,288
- E. Not given

85. What is the radius, in centimeters, of a circle that has a circumference of 16π centimeters?

- A. 8
- B. 16
- C. 32
- D. 64
- E. Not given

86. The diagram below shows three lines that intersect to form a triangle. Based on the angle measures in the diagram, what is the value of x ?



- A. 32
- B. 67
- C. 81
- D. 99
- E. Not given

87. A circle inscribed in a square is shown below. The area of the square is 81 square centimeters. Which of the following is closest to the circumference, in centimeters, of the circle inscribed in the square? (Use 3.14 for π)

- A. 14.13
- B. 28.26
- C. 63.59
- D. 127.17
- E. Not given

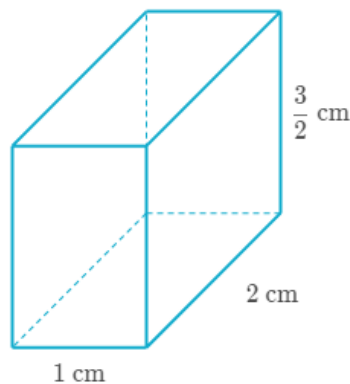
88. A disk in the shape of a circle has a diameter of 64 millimeters. What is the radius of the disk?

- A. 8 mm B. 32 mm C. 64 mm D. 128 mm E. Not given

89. Muhammed bought a circular tablecloth that has a radius of 3 feet. What is the circumference, to the nearest foot, of Linda's tablecloth? (Use 3.14 for π .)

- A. 6 feet B. 9 feet C. 19 feet D. 28 feet E. Not given

90. How many $\frac{1}{2}$ cm cubes does it take to fill the prism pictured below?



- A. 3 B. 8 C. 12 D. 24 E. Not given