Kansas City Area Teachers of Mathematics
2014 KCATM Math Competition

GEOMETRY AND MEASUREMENT TEST
GRADE 5

INSTRUCTIONS

- **Do not open this booklet** until instructed to do so.

- Time limit: **15 minutes**

- You **may use calculators** on this test.

- Use the π **key** on your calculator **or 3.14159** as the approximation for pi.

- Mark your answer on the answer sheet by **FILLING in the oval**.

- You **may not use rulers, protractors, or other measurement devices** on this test.

Student Name _____ Student Number _____

School _____

51. What is the **volume** of the solid shown in figure 1?

A. 10 cubic units
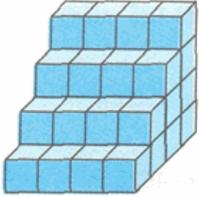B. 20 cubic units
C. 30 cubic units
D. 40 cubic units
E. None of the above

Figure 1

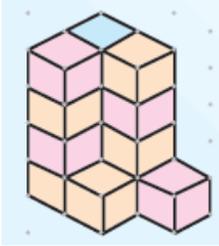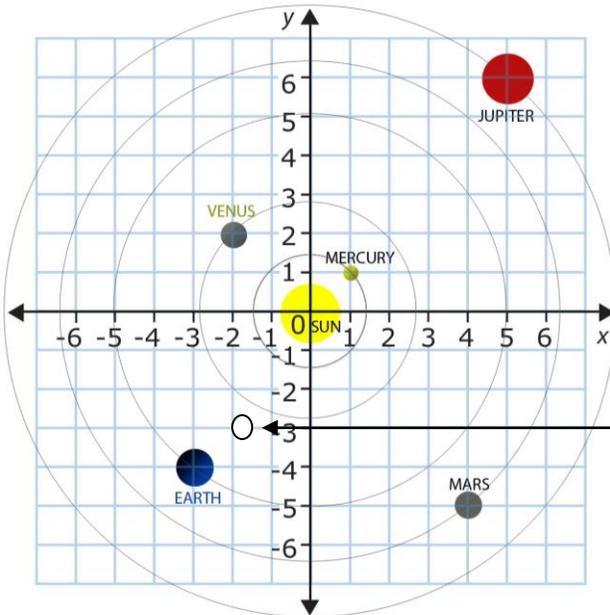52. What would be the **volume** of the rectangular solid in Figure 2?

A. 7 cubic units
B. 14 cubic units
C.   20 cubic units
D. 30 cubic units
E. None of the above

Figure 2

Use the coordinate grid for problems 53-55.

Venus's new coordinates for question 55.

53. What are the coordinates of the Jupiter?
   A. (6, 5)   B. (5,-6)   C. (-4, -1)   D. (5, 6)   E. None of the above

54. Name the coordinates of another point that would form a parallelogram with the Sun, Mercury and Venus.
   A. (-1, 3)   B. (1, -1)   C. (1, -3)   D. (2, 4)   E. None of the above

55. The planets are traveling on the orbits, and what are the coordinates of the Earth when coordinates of the Venus is (-2, -2)?
   A. (0, -6)   B. (3, -4)   C. (-5, 5)   D. (-1, -1)   E. None of the above

56. The dimensions of the soccer field are 120 yards by 70 yards, and there are 1,760 yards in one mile. Taylor runs 10 laps around the high school soccer field every day. How far does Taylor run after 4 days? Round your answer to the nearest tenth of a mile.
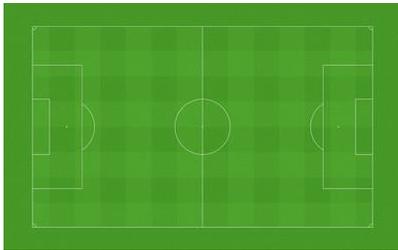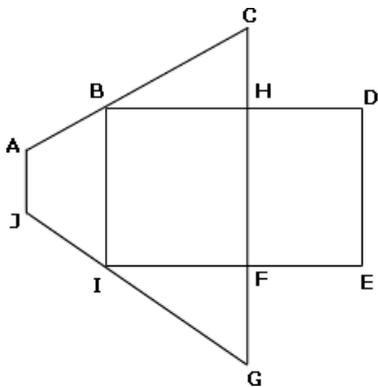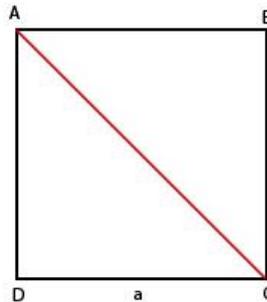
70 yd

120 yd

A. 8.6 miles
B. 6.4 miles
C. 5.3 miles
D. 9.6 miles
E. 3.6 miles

57. How many parallelograms are in the following figure?

A. 1
B. 2
C. 3
D. 4
E. 5

Use the square for problems 58-60.

58. Name two sides that are parallel.
   A. $\overline{AB}, \overline{BC}$ B. $\overline{AB}, \overline{BD}$ C. $\overline{DA}, \overline{CB}$ D. $\overline{AD}, \overline{AB}$ E. None of the above

59. Name 2 sides that are **perpendicular**.
   A. $\overline{AC}, \overline{BD}$ B. $\overline{AB}, \overline{BC}$ C. $\overline{DC}, \overline{CA}$ D. $\overline{DC}, \overline{AB}$ E. None of the above

60. In the square ABCD, one diagonal is "d". Which statement is true:
   A. A square has 4 straight angles.
   B. Triangles ADC and ABC are symmetric.
   C. The diagonal splits the square into 2 equilateral triangles.
   D. A square is not a parallelogram.
   E. All statements are wrong.

61. Which of the following is **not** a parallelogram?
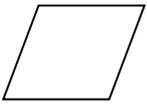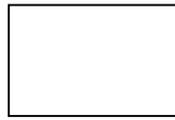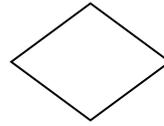
   A.   B.   C.   D.   E. All are parallelograms

62. Which of the following statements is **true**?
   A. If a rhombus has four right angles, it is a square but not a parallelogram.
   B. If a rhombus has four right angles, it is a rectangle but not a parallelogram.
   C. If a rhombus has four right angles, it is a square but not a quadrilateral.
   D. If a rhombus has four right angles, it is a rectangle but not a quadrilateral.
   E. None of the statements are true.

63. Using the chart below, name the three missing quadrilaterals A, B, and C?
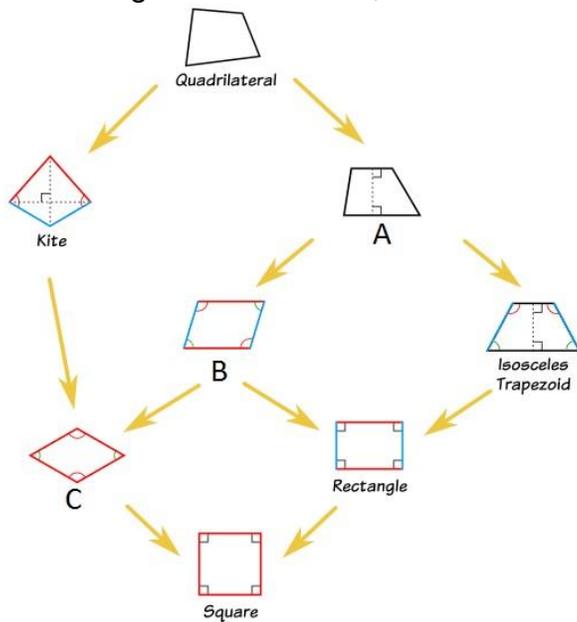
	A	B	C
A.	Kite	Trapezoid	Parallelogram
B.	Trapezoid	Rhombus	Parallelogram
C.	Rhombus	Parallelogram	Trapezoid
D.	Trapezoid	Parallelogram	Rhombus
E.	None of the above		

Quadrilateral

Kite

A

B

Isosceles Trapezoid

C

Rectangle

Square

64. What number is formed when you connect these points in order on the coordinate grip below?
(4,8), (5,8), (6,8), (8,8), (7,6), (6,4), (5,2), (6,5), and (7,5)
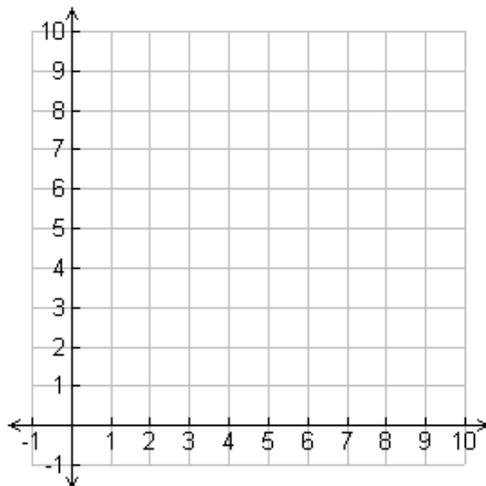
   A.   5

   B.   6

   C.   7

   D.   8

   E.   None of the above

Use the rectangular solid for questions 65-66.
65. What is the **area of the front face** of the Rubik cube?
   A. 5 sq. cm.   B. 10 sq. cm.   C. 15 sq. cm.
   D. 25 sq. cm.   E. None of the above

66. What is the volume of the following Rubik cube?

   A.   25 cu. cm.   B. 50 cu. cm.
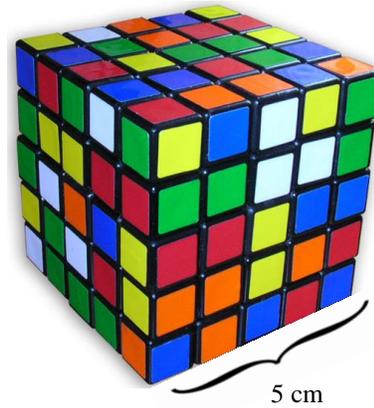   C.   75 cu. cm.   D. 100 cu. cm.
   E. None of the above

5 cm

Use the solid for questions 67-69.
67. If each of the decomposed shapes are cubes.
   What is the **volume** of the figure?
   A. 12 cu. cm   B. 10 cu. cm
   C. 8 cu. cm   D. 4 cu. cm
   E. None of the above

http://www.bilgicik.com/yazi/6-sinif-hacim-olcme/
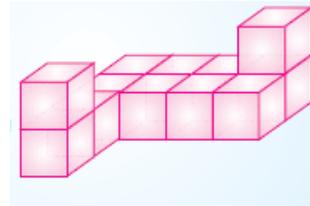
68. How many 1cm x 1cm cubes do you need if you complete it to a rectangular solid (prism)?
   A. 10   B. 20   C. 30   D. 40   E. None of the above

http://www.bilgicik.com/yazi/6-sinif-hacim-olcme/
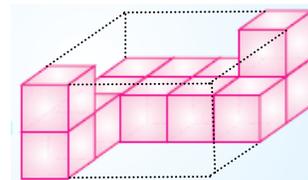
69.   How many 1cm x 1cm faces does this figure have if you
   were to wrap the rectangular solid completely with wrapping paper (total surface area of the
   completed figure- rectangular solid)?

   A. 16 sq. units   B. 32 sq. units   C. 64 sq. units   D. 128 sq. units E. None of the above

70. A carpenter cut the red painted part (shape A) of the
rectangular solid (prism) wood, and added the piece
next to it as it is shown in shape B. Which of the
following is true about the volume of the new shape (B)?

A. increases 30 cu. cm.
B. decreases 35 cu. cm.
C. increases 45 cu. cm.
D. decreases 25 cu. cm.
E. volume does not change.

71. _____is a triangle with all three sides of equal length.
The math term that fills the blank is:
A. Isosceles Triangles   B. Tessellation   C. Equilateral Triangle
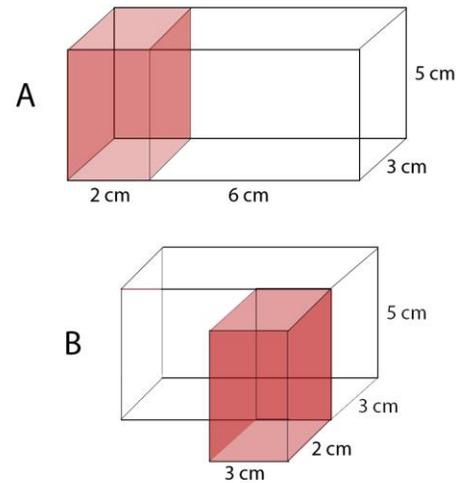D. Symmetry   E. None of the above

**Use the figure at the right for problems 72-76 by assuming it is the
collection of <u>congruent isosceles triangles</u>. The center is "O".**

72. How many lines of symmetry does the figure have?
   A. 20   B. 35   C. 40   D. 45   E. None of the above

73. When the same shape is repeated over and over again without
gaps, the math term is _____.
A. Equilateral Triangle
B. Symmetry
C. Quadrilateral
D. Tessellation
E. None of the above
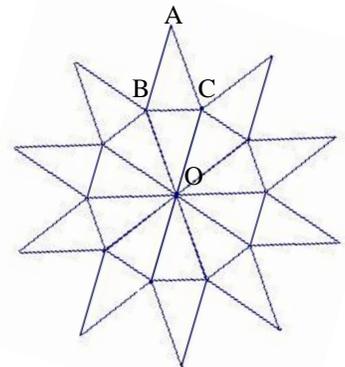
74. What is the degree measure of $\angle BAC$?
   A. 36º   B. 60º   C. 45º   D. 30º   E. None of the above

75. What is the degree measure of $\angle BOC$?
   A. 45º   B. 90º   C.36º   D. 30º   E. None of the above

76. What is the degree measure of $\angle ABO$?
   A. 72 º   B. 180º   C. 144º   D. 120º   E. None of the above

Use the graph for problems 77-80.

77. What is the best descriptor of triangle ABC?
    A. Right scalene triangle
    B. Acute scalene triangle
    C. Right isosceles triangle
    D. Equilateral triangle
    E. None of the above

78. $\overline{BC}$ is what type of line segment?
    A. Diagonal   B. Horizontal
    C. Vertical   D. Not enough information
    E. None of the above

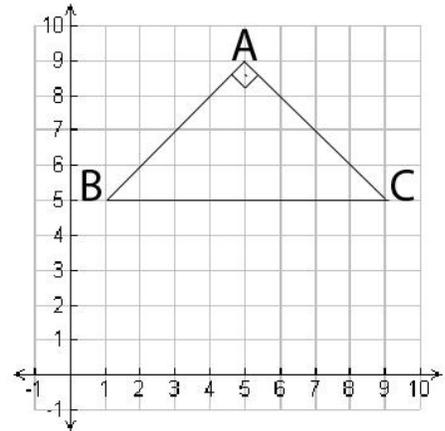79. Name another point on the graph that will form a symmetrical triangle ABC by using $\overline{BC}$ as <u>line of symmetry</u>?
    A. (1,5)   B. (5, 1)   C. (2, 5)   D. (5,2)   E. None of the above

80. Find the area of the triangle ABC.
    A. 4 sq. units   B. 8 sq. units   C. 16 sq. units   D. 32 sq. units   E. None of the above

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81. Honey bees commonly fly up to 6.5 kilometers to collect nectar and pollen from flowers. What is the equivalence of this distance in meters?
    A. 0.65 m.
    B. 65 m.
    C. 650 m.
    D. 6,500 m.
    E. None of the above

82. School administration decides to set up a flagpole which is 1,060 centimeters high. How many meters tall is the flagpole?
    A. 0.0106 m   B. 0.106 m   C. 1.06 m   D. 10.60m   E. None of the above

83. If a baby was born weighing 3,750 grams, how many <u>kilograms</u> did the baby weigh?
    A. 0.0375kg   B. 0.375kg   C. 3.750 kg   D. 37.50 kg   E. None of the above

84. SJ drinks a glass of milk which is 300 milliliters every day. How many <u>liters</u> does he drink in <u>one week</u>?
    A. 2.1 liters   B. 0.21 liters   C. 21 liters   D. 12 liters   E. None of the above

85. If a paper plane flies 180 feet, how many yards does the plane fly?
A. 30 yd.   B. 40 yd.   C. 50 yd.   D. 60 yd.   E. None of the above

86. If a container holds 64 cups of water, how many gallons of water does it hold?
A. 2 gal.   B. 4 gal.   C. 8 gal.   D. 16 gal.   E. None of the above

87. If a container holds 16 gallons of water, how many quarts of water does it hold?
A. 4 quarts   B. 8 quarts   C. 16 quarts   D. 32 quarts   E. None of the above

88. The length of an ultra-marathon is 50 miles. How many feet are in an ultra-marathon?
A. 264,000ft.   B. 26,400 ft.   C. 255,400 ft.   D. 5,280 ft.   E. None of the above

89. A bakery shop uses 15 ½ pounds of flour to make breads. How many ounces of flour does the bakery use?
A. 248 oz.   B. 428 oz.   C. 128 oz.   D. 236 oz.   E. None of the above

90. The conversion between foot to centimeter is 1 foot = 30.48cm. How many centimeters are there in one yard?
A.   9.144cm   B. 194.4cm   C. 91.44 cm   D. 19.4cm   E. None of the above

Shade the correct answer!

Example: A   ●   C   D   E

Name_____

School _____

51.	A	B	C	D	E
52.	A	B	C	D	E
53.	A	B	C	D	E
54.	A	B	C	D	E
55.	A	B	C	D	E
56.	A	B	C	D	E
57.	A	B	C	D	E
58.	A	B	C	D	E
59.	A	B	C	D	E
60.	A	B	C	D	E
61.	A	B	C	D	E
62.	A	B	C	D	E
63.	A	B	C	D	E
64.	A	B	C	D	E
65.	A	B	C	D	E
66.	A	B	C	D	E
67.	A	B	C	D	E
68.	A	B	C	D	E
69.	A	B	C	D	E
70.	A	B	C	D	E

71.	A	B	C	D	E
72.	A	B	C	D	E
73.	A	B	C	D	E
74.	A	B	C	D	E
75.	A	B	C	D	E
76.	A	B	C	D	E
77.	A	B	C	D	E
78.	A	B	C	D	E
79.	A	B	C	D	E
80.	A	B	C	D	E
81.	A	B	C	D	E
82.	A	B	C	D	E
83.	A	B	C	D	E
84.	A	B	C	D	E
85.	A	B	C	D	E
86.	A	B	C	D	E
87.	A	B	C	D	E
88.	A	B	C	D	E
89.	A	B	C	D	E
90.	A	B	C	D	E

Shade the correct answer!
Example: A   ●   C   D   E

Name_____

School _____

ANSWER KEY - CHANGE NEEDED

51.   A   B   C   ●   E
52.   A   ●   C   D   E
53.   A   B   C   D   ●
54.   ●   B   C   D   E
55.   A   ●   C   D   E
56.   ●   B   C   D   E
57.   A   B   ●   D   E
58.   A   B   ●   D   E
59.   A   ●   C   D   E
60.   A   ●   C   D   E
61.   A   B   C   D   ●
62.   ●   B   C   D   E
63.   A   B   C   ●   E
64.   A   B   ●   D   E
65.   A   B   C   D   ●
66.   A   B   C   ●   E
67.   ●   B   C   D   E
68.   A   ●   C   D   E
69.   A   B   ●   D   E
70.   A   B   C   ●   E

71.   A   B   ●   D   E
72.   ●   B   C   D   E
73.   A   B   C   ●   E
74.   A   ●   C   D   E
75.   ●   B   C   D   E
76.   A   B   C   D   ●
77.   A   B   ●   D   E
78.   A   ●   C   D   E
79.   A   ●   C   D   E
80.   A   B   ●   D   E
81.   A   B   C   ●   E
82.   A   B   C   ●   E
83.   A   B   ●   D   E
84.   ●   B   C   D   E
85.   A   B   C   ●   E
86.   A   ●   C   D   E
87.   A   B   C   D   ●
88.   ●   B   C   D   E
89.   ●   B   C   D   E
90.   A   ●   C   D   E
91.   A   B   ●   D   E