Kansas City Area Teachers of Mathematics
2014 KCATM Math Competition

GEOMETRY AND MEASUREMENT TEST
GRADE 6

INSTRUCTIONS

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

- Time limit: **20 minutes**
- You **may use calculators**.
- 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.
- Letter **"E" is "None of the above"**. It is a correct answer for some of the problems.
- Use the π key or 3.14159 on your calculator.
- The pictures in the figures are **"not-to-scale."**

Area Formulas:	
Triangle	A = ½ bh
Parallelogram	A = bh
Trapezoid	A = ½ h (b$_1$ + b$_2$)

Volume Formulas:	
Rect. Prism	V = l x w x h
Cylinder	V = π r^2 h

Student Name _____ Student Number _____
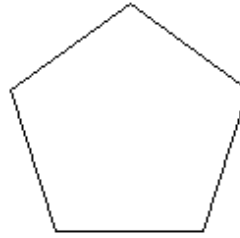
School _____

Write the name of each polygon.

51)
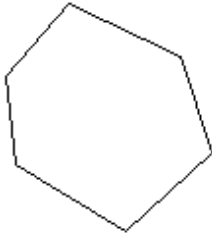
A) decagon   B) pentagon
C) nonagon   D) hexagon
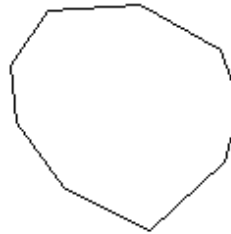E) None of the above

52)

A) pentagon   B) hexagon
C) heptagon   D) quadrilateral
E) None of the above

53)

A) heptagon   B) nonagon
C) quadrilateral   D) pentagon
E) None of the above

54)

A) decagon   B) nonagon
C) quadrilateral   D) pentagon
E) None of the above

Solve each proportion:

55) $\dfrac{3}{7} = \dfrac{4}{x}$

A) $\{9.33\}$ B) $\{3.29\}$
C) $\{9.4\}$ D) $\{4.9\}$
E) None of the above

56) $\dfrac{n-3}{3} = \dfrac{10}{6}$

A) $\{-4.6\}$ B) $\{8\}$
C) $\{3.4\}$ D) $\{6.3\}$
E) None of the above

57) Given the picture of a Rubic's cube, how many cubes make up this puzzle?

A)   24
B)   28
C)   30
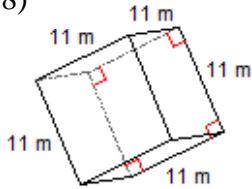D)   36
E)   None of the above

Volume Formulas:

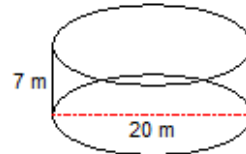Rect. Prism: V = l x w x h   Cylinder: V = π r² h

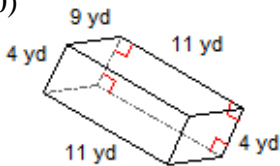**Find the volume of each figure. Round your answers to the nearest whole, if necessary.**

58)

11 m
11 m
11 m
11 m
11 m

A) 1093 m³   B) 1159 m³
C) 1331 m³   D) 1097 m³
E) None of the above

59)

7 m
20 m

A) 8796 m³   B) 1953 m³
C) 2795 m³   D) 2199 m³
E) None of the above

60)

9 yd
4 yd
11 yd
11 yd
4 yd

A) 321 yd³   B) 396 yd³
C) 309 yd³   D) 511 yd³
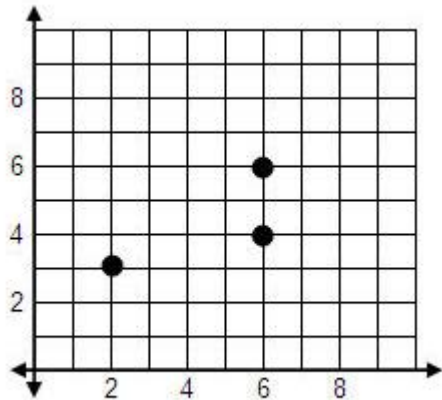E) None of the above

61)
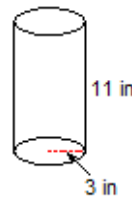
11 in
3 in

A) 220 in³   B) 101 in³
C) 311 in³   D) 438 in³
E) None of the above

62) Alex is planting a garden and is mapping it out on this coordinate grid. The garden is to be 4 units wide horizontally and 6 units long vertically. If the center is located at the origin, what are the other coordinates of the garden?
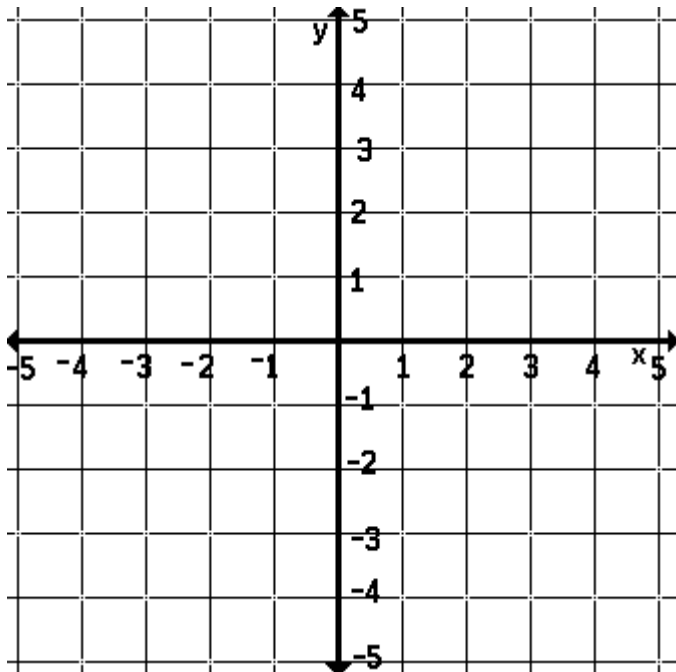
A)   (4,0) , (0,6) , (4,6) , (0, 0)

B)   (-3,0), (3,0), (0, 2), (-2, 0)

C)   (-3, 2), (-3, -2), (3, -2), (3, 2)

D)   (-2, -3), (2, -3), (-2, 3), (2, 3)
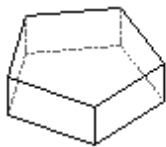
E)   None of the above

63) Use the coordinate graph to name the 4ᵗʰ point that would **NOT** make the figure a parallelogram.

A)   (2, 5)

B)   (2, 1)

C)   (10, 7)

D)   (4, 3)

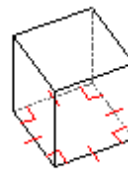E)   None of the above

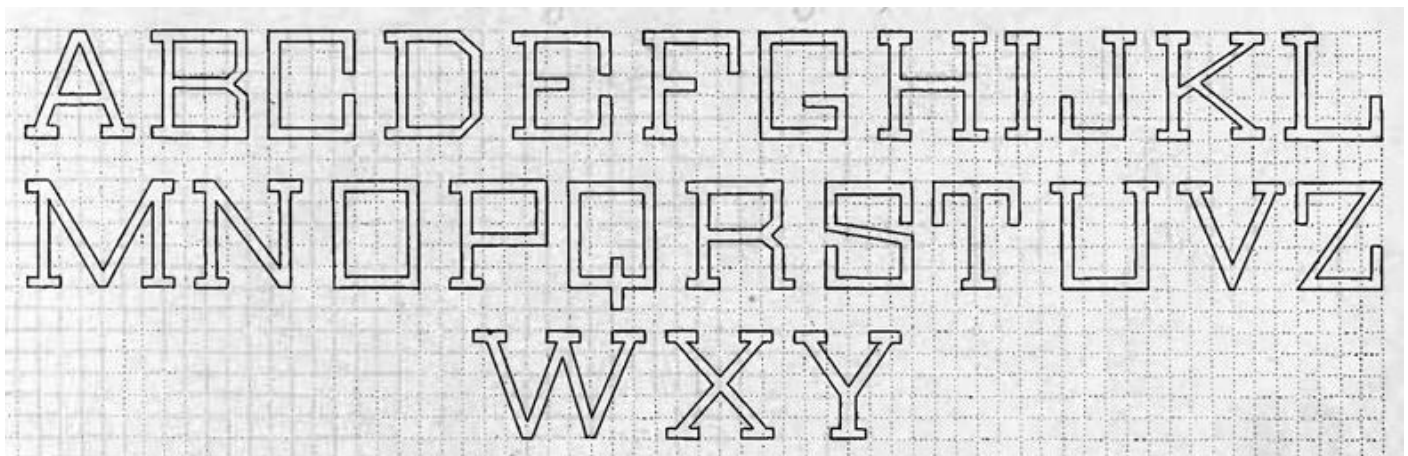**Name each figure.**

64)

A) trapezoidal prism
B) pentagonal prism
C) cylinder
D) hexagonal prism
E) None of the above

65)

A) square pyramid
B) square prism
C) trapezoidal prism
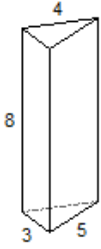D) pentagonal pyramid
E) None of the above

66) Using the picture of the block letters, how many of the capital letters have vertical line symmetry? Please note: the Q has the bottom mark off-center.
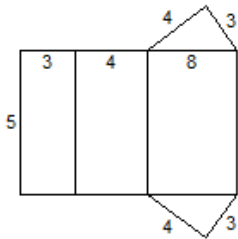
A)   11   B) 7   C) 9   D) 13   E) None of the above

Which sketch of a solid matches the net?

67)

A)

B)

C)

D)
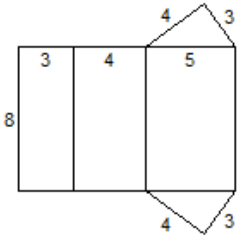
E) None of the above

68)

A)

B)

C)

D)

E) None of the above

69) If you run a marathon, approximately how far do you run?

      A) 5 miles   B) 2.5 miles   C) 13 miles   D) 26 miles   E) None of the above

70) If you drink eight 8 ounce glasses of water a day, how many quarts of water is that?

      A) 1 qt.   B. 2 qts.   C) 3 qts.   D) qts.   E) None of the above

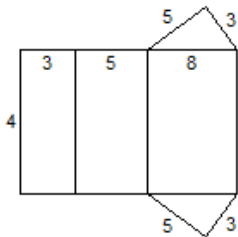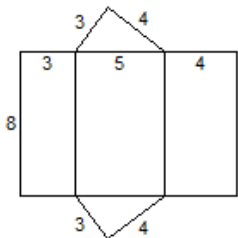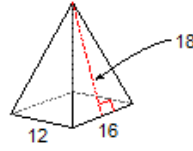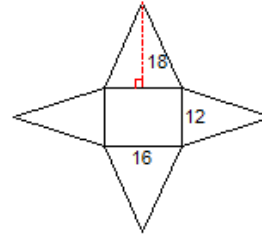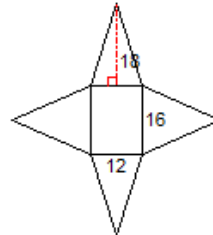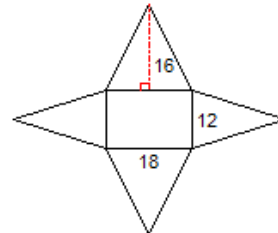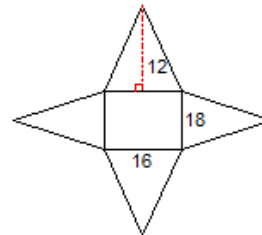**Find the area of each.**

71)
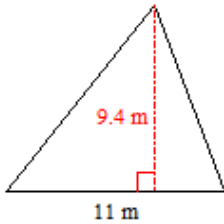
A) 103.4 m²   B) 25.9 m²
C) 49.6 m²   D) 51.7 m²
E) None of the above

72)

2 in
7.1 in
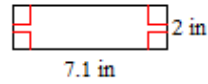
A) 21.5 in²   B) 28.4 in²
C) 14.2 in²   D) 7.1 in²
E) None of the above

73)

2.4 km
2.4 km
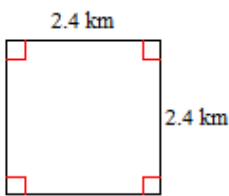
A) 0.06 km²   B) 5.76 km²
C) 2.9 km²   D) 11.52 km²
E) None of the above

74) Parallelogram in the figure below:

8 ft
9 ft
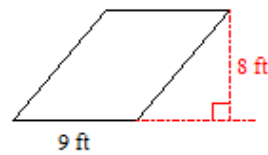
A) 79.9 ft²   B) 144 ft²
C) 72 ft²   D) 36 ft²
E) None of the above

Find the missing measurement. Round your answer to the nearest tenth.

75)
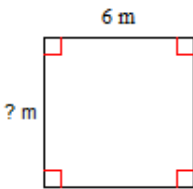
6 m
? m
Area = 36 m²

A) 6.6 m   B) 6.4 m
C) 6 m   D) 6.9 m
E) None of the above

76)
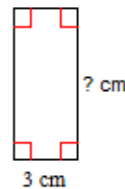
? cm
3 cm
Area = 21 cm²

A) 9.3 cm   B) 5.3 cm
C) 4.4 cm   D) 7 cm
E) None of the above

77)
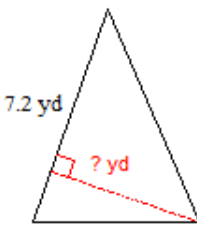
7.2 yd
? yd
Area = 18 yd²

A) 6.1 yd   B) 4.9 yd
C) 5 yd   D) 4.5 yd
E) None of the above

78)
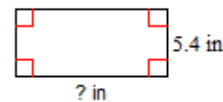
5.4 in
? in
Area = 64.8 in²

A) 15.1 in   B) 13.9 in
C) 12 in   D) 7.8 in
E) None of the above

Use the square below, to answer the questions 79-81.

$2x - 1$
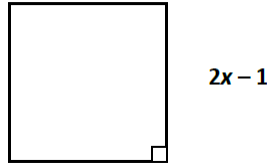
79) What is the perimeter of the square?

    A)   4x - 2   B) 8x - 1   C) 16x - 4   D) 8x - 4   E) None of the above

80) If the length of each side is doubled, what would be the perimeter of the new square?

    A)   16x – 8   B) $4x^2 – 4x + 1$ C) 32x – 8   D) $4x^2 – 1$ E) None of the above

81) If x = 5, what would be the reduced ratio of the **area** of the **original square** to the **area** of the **new square**?

    A) 1:4   B) 10:19   C) 81:324   D) 1:2   E) None of the above

---

82) Plot the vertices of a quadrilateral: P(-9, 7), Q(4,7), R(4,-3), and S(-9,-3). What is the area, in square units of **quadrilateral PQRS**?
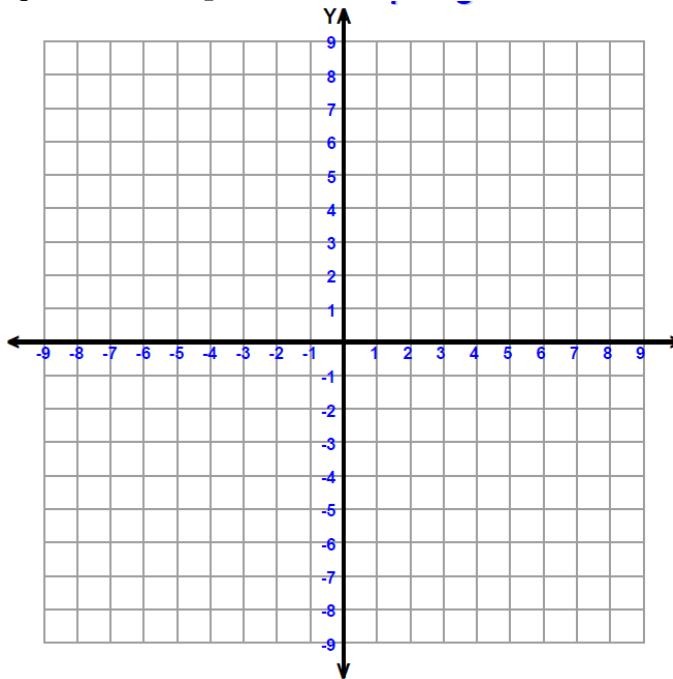
A)   95 sq. units

B)   130 sq. units

C)   103 sq. units

D)   100 sq. units

E)   None of the above

---

83) If you rotate a rectangle about one side of the rectangle, which shape would you create?

    A) rectangle   B) square   C) cylinder   D) sphere   E) None of the above

84) What shape is the planet Mars?

    A) rectangle   B) square   C) cylinder   D) sphere   E) None of the above

85) What is the appropriate measure of the length of an ink pen?

    A) 10 cm   B) 1 meter   C) 0.5 km   D) 5 grams   E) None of the above

86)   **Connect each sequence of points with a line.**

(6,2) , (5,2) , (5,3) , (-2,3) , (-2,-2) , (6,-2) , (6,-9) , (-3,-9) , (-3,-7)

(-2,-7) , (-2,-8) , (5,-8) , (5,-3) , (-3,-3) , (-3,4) , (6,4) , (6,2) End of Sequence
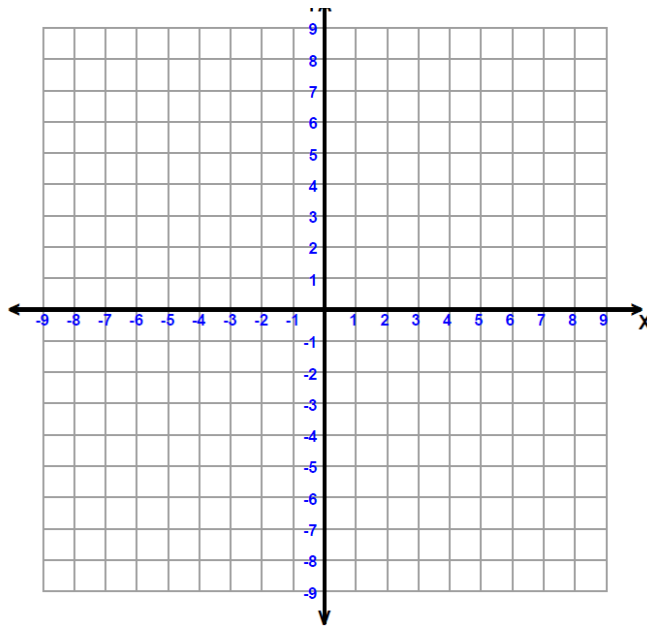
Which letter did you graph?

A)   G

B)   S

C)   C

D)   O

E)   None of the above

87) What is the weight of water that fills the rectangular prism whirl pool below that is 3m by 4m by 3m deep if the weight of one cubic meter of water is 1000 kg?

A) 10,000 kg   B) 36,000 kg

C) 15,000 kg   D) 40,000 kg

E) None of the above

88) Which transformation is the name for "sliding" the pre-image to the image?
   A) reflection   B) rotation   C) glide   D) translation   E) None of the above

89)   Complementary angles are two angles that add up to what degrees?
   A) 50º   B) 90º   C) 100º   D) 180º   E) None of the above

90) On the map below, First Avenue and Second Avenue run parallel. What are the angle measures of the garden area?
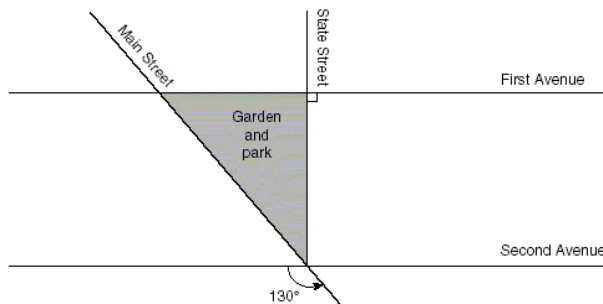
A) 90º, 50º, 40º
B) 90º, 65º, 25º
C) 90º, 60º, 30º
D) 130º, 40º, 10º
E) None of the above

Shade the correct answer!

Example: A   ●   C   D   E

Name_____

School _____

51.	A	B	C	D	E	71.	A	B	C	D	E
52.	A	B	C	D	E	72.	A	B	C	D	E
53.	A	B	C	D	E	73.	A	B	C	D	E
54.	A	B	C	D	E	74.	A	B	C	D	E
55.	A	B	C	D	E	75.	A	B	C	D	E
56.	A	B	C	D	E	76.	A	B	C	D	E
57.	A	B	C	D	E	77.	A	B	C	D	E
58.	A	B	C	D	E	78.	A	B	C	D	E
59.	A	B	C	D	E	79.	A	B	C	D	E
60.	A	B	C	D	E	80.	A	B	C	D	E
61.	A	B	C	D	E	81.	A	B	C	D	E
62.	A	B	C	D	E	82.	A	B	C	D	E
63.	A	B	C	D	E	83.	A	B	C	D	E
64.	A	B	C	D	E	84.	A	B	C	D	E
65.	A	B	C	D	E	85.	A	B	C	D	E
66.	A	B	C	D	E	86.	A	B	C	D	E
67.	A	B	C	D	E	87.	A	B	C	D	E
68.	A	B	C	D	E	88.	A	B	C	D	E
69.	A	B	C	D	E	89.	A	B	C	D	E
70.	A	B	C	D	E	90.	A	B	C	D	E

Shade the correct answer!

Example: A   ●   C   D   E

Name_____

School _____

ANSWER KEY

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