Kansas City Area Teachers of Mathematics
2016 KCATM Math Competition

GEOMETRY TEST
GRADE 7

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	$A = \frac{h(b_1 + b_2)}{2}$

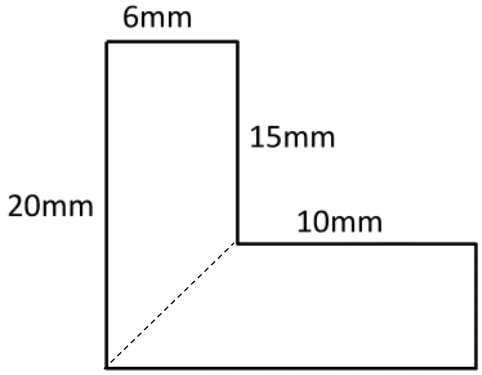
Volume Formulas:

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

Student Name _____ Student Number _____

School _____

Use the following composite shape for problems #51-53.



51. What is the **perimeter of the L shaped figure**?

A. 72mm B. 51mm C. 71mm D. 120mm E. None of the above

52. What is the **area of the L shaped figure**?

A. 120mm^2 B. 140mm^2 C. 150mm^2 D. 170mm^2 E. None of the above

53. **If a diagonal line** *(see dashed line above*) **was drawn to form 2 trapezoids, what would be the area of the trapezoid on the left?**

A. 41mm^2 B. 75mm^2 C. 105mm^2 D. 85mm^2 E. None of the above

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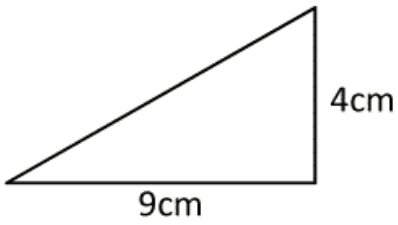
Use the triangle on the right for problems #54-56.



54. What is the **area of the right triangle**?

A. 13cm^2 B. 18cm^2 C. 26cm^2
D. 6.5mm^2 E. None of the above

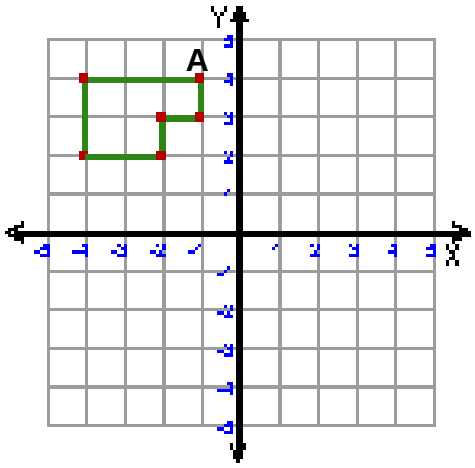
55. Which term best describes the right triangle **classifying it by its sides**?

A. Equilateral B. Isosceles C. Scalene D. Acute E. None of the above

56. What is the **sum of the two acute angles** in the right triangle?

A. 45^o B. 60^o C. 75^o D. 180^o E. None of the above

Use the composite shape in the coordinate plane for problems #57-59.



57. If you reflect the figure below **across the x-axis**, what would be the coordinates of the A' (the reflection of pt. A)?
A. (-1, -4) B. (1, 4) C. (4, 1)
D. (1, -4) E. None of the above

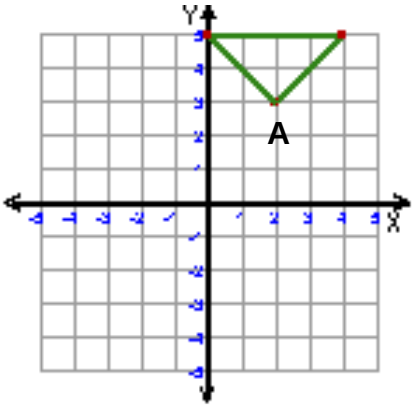
58. If you reflect the figure below **across the y-axis**, what would be the coordinates of the A'?

B. (-4, -1) B. (1, 4) C. (4, 1)
D. (1, -4) E. None of the above

59. If you translate the figure < 3, - 5 >, what would be the coordinates of the A'.

A. (-1, 2) B. (6, 7) C. (-4, 9)
D. (2, -1) E. None of the above

Use the triangle in the coordinate plane for problems #60-62.



60. **Classify** the type of triangle in the diagram.
A. Isosceles Right B. Scalene Acute
C. Obtuse Isosceles D. Equilateral
E. None of the above

61. If you reflect the triangle first across the y-axis, and then across the x-axis, what would be the location of A'?
A. (2, 3) B. (-2, -3) C. (-2, 3)
D. (2, -3) E. None of the above

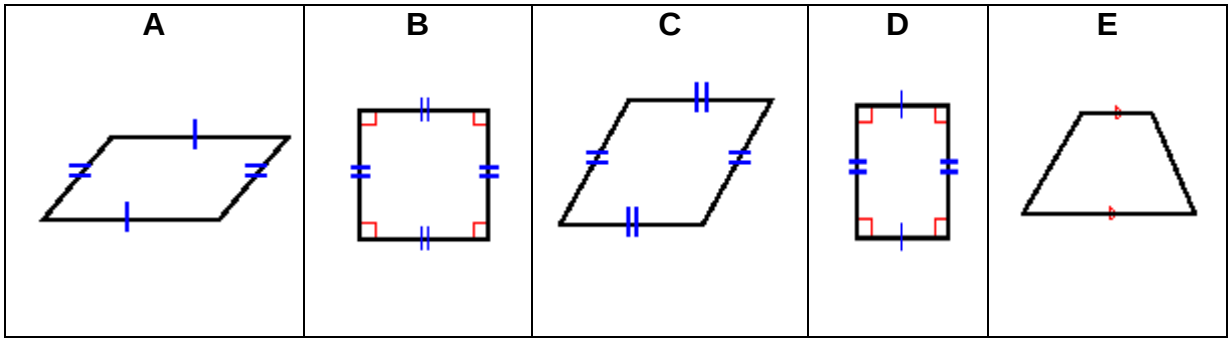
62. If you stretch the triangle so that pt. A is placed vertically on the x-axis, what is the **difference** between the original area and the new **area**?
B. 4 sq.units B. 5 sq. units C. 6 sq. units
D. 8 sq. units E. None of the above

63. What is the **circumference** of a circle with radius 5 km? Round to the nearest tenth.
A. 15.7 km B. 31.4 km C. 78.5 km D. 47.1 km E. None of the above

64. If the area of a circle is 153.94cm^2, what is the radius?

A. 9cm. B. 8cm C. 6cm D. 7cm E. None of the above

Use the figures below to respond to problems #65-69.



65. Which of the above figures are **parallelograms**?
A. A B. A & C C. B & D D. A, B, C & D E. None of the above

66. Which of the above figures are **rhombi**?
A. A B. B C. B & C D. E E. None of the above

67. Which of the above figures are **rectangles**?
A. D B. B C. A & C D. B & D E. None of the above

68. Which of the above figures are **quadrilaterals**?
A. A & C B. B & D C. A, B, C, D & E D. A, B, C & D E. None of the above

69. Which of the following statements is **NOT** true?

A. A parallelogram is sometimes a rectangle, and a rectangle is always a parallelogram.
B. A square is always a rectangle, but a rectangle is always a square.
C. A trapezoid is always a quadrilateral, but a trapezoid is never a parallelogram.
D. A rhombus is sometimes a square, but a square is always a rhombus.
E. All statements are true.

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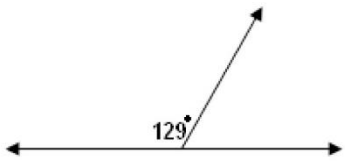
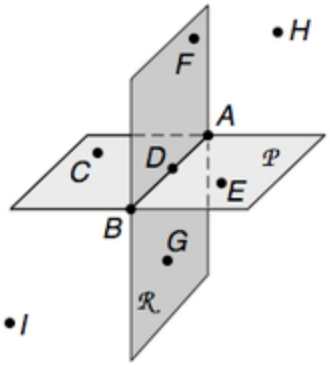
70. Which best describes the 2 angles? Find the missing angle measure. Both must be true.



A. Supplementary; 41°
B. Linear Pair; 51°
C. Vertical; 61°
D. Congruent; 129°
E. None of the above

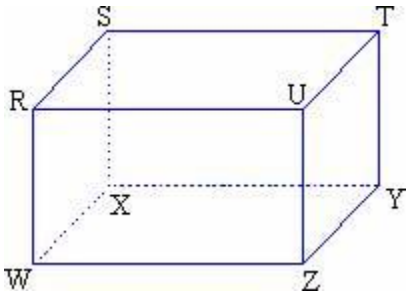
Use the diagram below to answer problems #71-72.



71. Name a line that is **<u>on</u>** with **Plane *P***.
A. $\overleftrightarrow{AB}$ B. $\overleftrightarrow{FG}$ C. $\overleftrightarrow{CH}$ D. $\overleftrightarrow{IE}$
E. None of the above

72. Name a point **<u>not</u>** on either Plane R or Plane P.
A. C B. G C. F D. B
E. None of the above

Use the rectangular solid below to answer problems #73-75.



73. Name a **horizontal face** on the rectangular solid.

A. RSXW B. XYZW C. RUWZ D. TUZY E. None of the above

74. Name a line segment that is **parallel** to $\overline{XY}$.

A. $\overline{YZ}$ B. $\overline{WX}$ C. $\overline{ST}$ D. $\overline{SX}$ E. None of the above

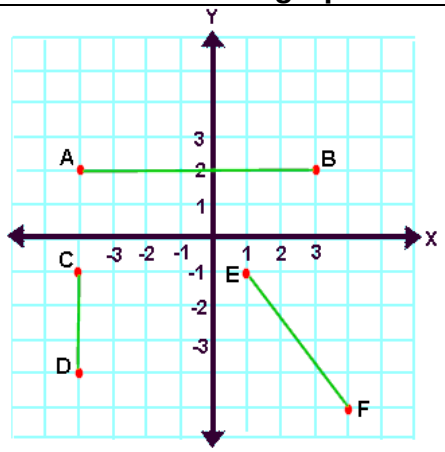
75. Name a line segment that is **perpendicular** to $\overline{XY}$.

A. $\overline{YZ}$ B. $\overline{RW}$ C. $\overline{WZ}$ D. $\overline{UZ}$ E. None of the above

76. Given: WZ is four less than twice ZY and ZY = UZ. If ZY = 9m, what is the volume of the rectangular solid?

A. $1782m^3$ B. $396m^3$ C. $252m^2$ D. $1134m^3$ E. None of the above

Use the coordinate graph below for problems #77-79.

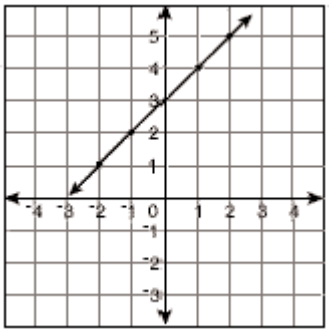


77. What is the **slope** of $\overline{AB}$?
A. 1 B. $1/7$ C. undefined
D. 0 E. None of the above

78. What is the **slope** of $\overline{EF}$?
A. $-3/4$ B. $-4/3$ C. undefined
D. 0 E. None of the above

79. Given the Pythagorean Theorem: In a right triangle, the sum of the squares of the legs equals the square of the hypotenuse, **find EF**.

A. 1 B. 3 C. 4 D. 5
E. None of the above

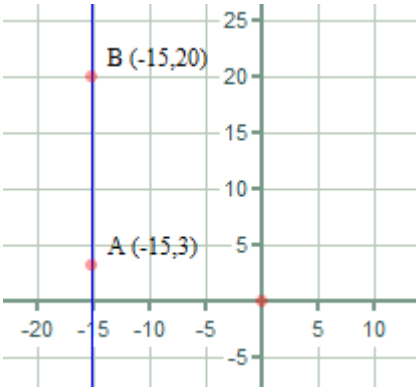


80. What is the **linear equation** for the line?

A. $y = -1x + 3$ B. $y = -3x + 1$

C. $y = 1x + 3$ D. $y = 3x + 1$

E. None of the above



81. What is the **linear equation** for the line AB?

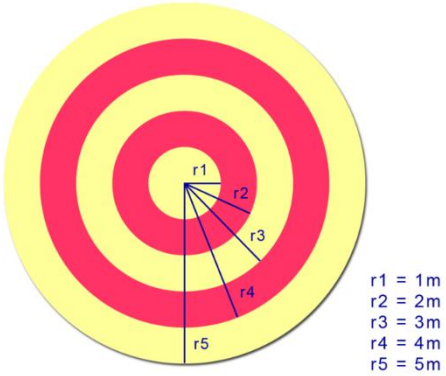
A. $y = 20$ B. $x = -15$

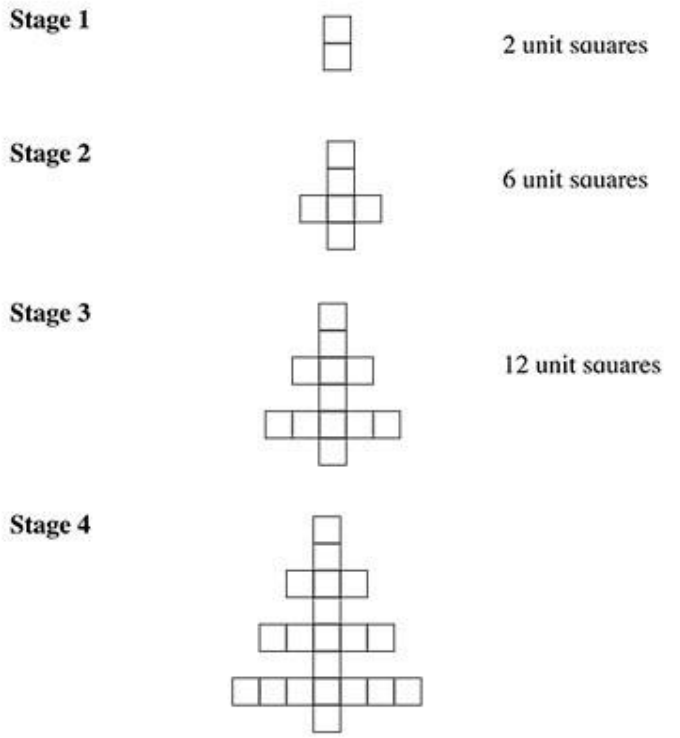
C. $y = 3$ D. $y = 17x - 5$

E. None of the above

82. What is the probability of landing in the bullseye?

A. 1/5 B. 1/10 C. 1/20
D. 1/25 E. None of the above





83. How many unit squares would be in **Stage 7**?

A. 30

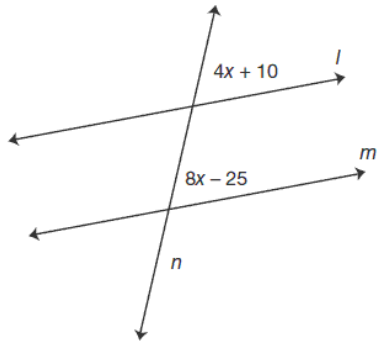
B. 42

C. 56

D. 72

E. None of the above

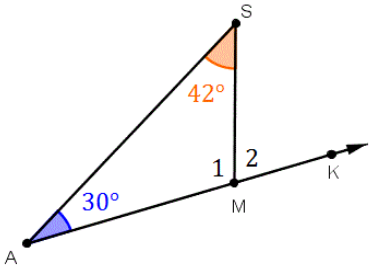
84. Given *l* || *m*. **Name the type of angles and then find the value of x.**



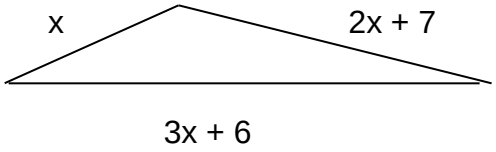
A. Vertical angles; x = 9
B. Same-side interior angles; x = 11
C. Corresponding angles; x = 8.75
D. Alternate interior angles; x = 8.75
E. None of the above

85. What are the **measures of angles 1 and 2** in the diagram below?

	$m\angle 1$	$m\angle 2$
A.	108°	72°
B.	72°	108°
C.	98°	82°
D.	82°	98°
E.	None of the above	

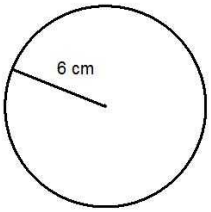


86. **Perimeter = 31** **Find x.**



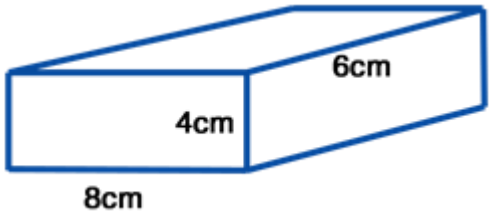
A. 2.25
B. 3
C. 2.5
D. 4
E. None of the above

87. Find the exact **circumference** and the **area**.



	Circumference	Area
A.	6π cm	36π cm^2
B.	6π cm	12π cm^2
C.	12π cm	36π cm^2
D.	12π cm	12π cm^2
E.	None of the above	

88. Find the **surface area**.

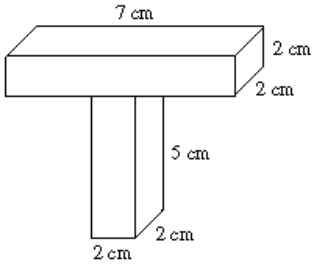


A. 56 sq. cm
B. 104 sq. cm
C. 112 sq. cm
D. 208 sq. cm
E. None of the above

Volume Formulas:

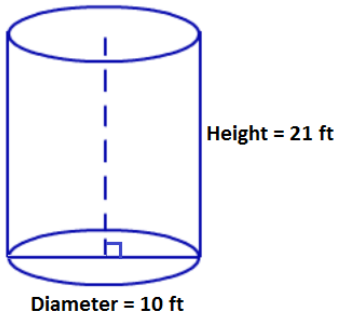
Rectangular Prism V = l x w x h **Cylinder:** V = π r^2 h

89. Find the **volume**.



A. 20 cm^3
B. 28 cm^3
C. 56 cm^3
D. 48 cm^3
E. None of the above

90. Find the exact **volume**.



A. 525 ft^3
B. 210 ft^3
C. 2100 ft^3
D. 105 ft^3
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.	●	B	C	D	E	71.	●	B	C	D	E
52.	A	B	C	●	E	72.	A	B	C	D	●
53.	A	B	●	D	E	73.	A	●	C	D	E
54.	A	●	C	D	E	74.	A	B	●	D	E
55.	A	B	●	D	E	75.	●	B	C	D	E
56.	A	B	C	D	●	76.	A	B	C	●	E
57.	A	B	C	●	E	77.	A	B	C	●	E
58.	A	●	C	D	E	78.	A	●	C	D	E
59.	A	B	C	●	E	79.	A	B	C	●	E
60.	●	B	C	D	E	80.	A	B	●	D	E
61.	A	●	C	D	E	81.	A	●	C	D	E
62.	A	B	●	D	E	82.	A	B	C	●	E
63.	A	●	C	D	E	83.	A	B	●	D	E
64.	A	B	C	●	E	84.	A	B	●	D	E
65.	A	B	C	●	E	85.	●	B	C	D	E
66.	A	B	●	D	E	86.	A	●	C	D	E
67.	A	B	C	●	E	87.	A	B	●	D	E
68.	A	B	●	D	E	88.	A	B	C	●	E
69.	A	B	C	D	●	89.	A	B	C	●	E
70.	A	●	C	D	E	90.	●	B	C	D	E