

Kansas City Area Teachers of Mathematics
2015 KCATM Math Competition

GEOMETRY AND MEASUREMENT TEST
GRADE 5

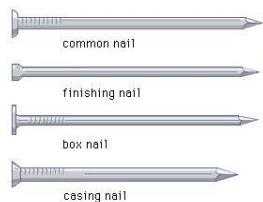
INSTRUCTIONS

- **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 _____

Use the given data in the chart about the length of different nails for problems #51-53.



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Nail Type By Letter	Length (inches)
F	1.241
G	1.236
H	1.274
J	0.944
K	0.942



51. Based on the table, which of the following comparison of nail length is **true**?

- A. $F > H$ B. $J < K$ C. $J > H$ D. $G < F$ E. None of the above

52. Put the nails in order from the **shortest to the longest (least to greatest)**.

- A. K, J, H, G, F B. K, J, G, F, H C. H, F, G, J, K
D. J, G, K, F, H E. None of the above

53. What is the **difference** in length from the longest nail and the shortest nail?

- A. 0.002 in. B. 0.038 in. C. 0.330 in. D. 0.332 in. E. None of the above

Use the information below for problems #54-55.

Place the following locations of doctors' offices and your location on the coordinate plane.

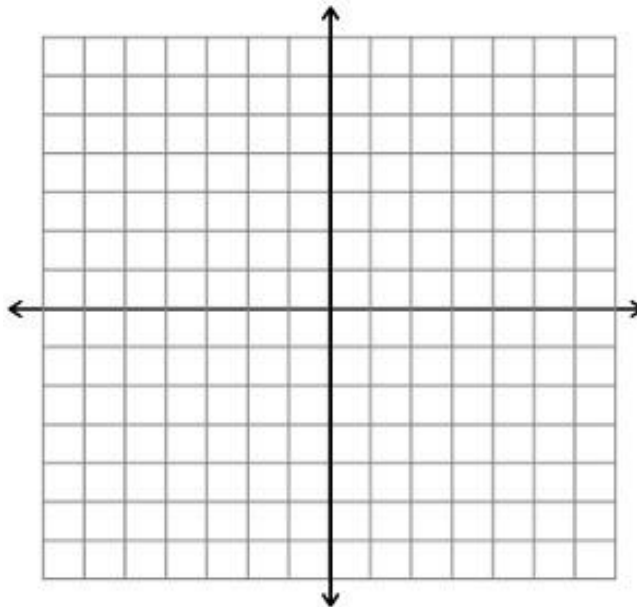
Dr. Schmidt: S(3,2)

Dr. Hodges: H(4,3)

Dr. Alvarez: A(6,4)

Dr. Logan: L(2, 5)

Your location: Y(3, 6)



54. Which doctor's office is closest to your location?

- A. Schmidt B. Hodges C. Alvarez D. Logan E. All the same distance

55. Which doctor's office is the farthest away from you?

- A. Schmidt B. Hodges C. Alvarez D. Logan E. All the same distance

Use the locker information for problems #56-58.

56. What is the **ratio** of the width to the length of the locker as a reduced fraction?

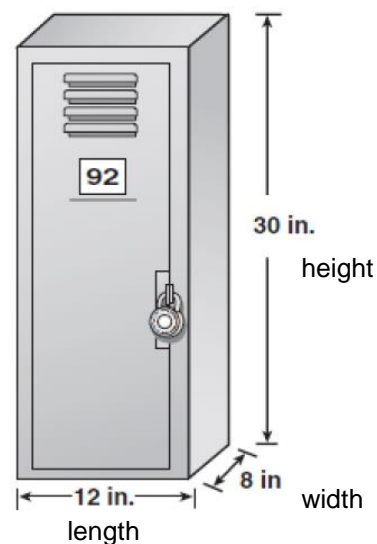
- A. $\frac{4}{3}$ B. $\frac{2}{3}$ C. $\frac{6}{15}$ D. $\frac{4}{15}$
E. None of the above

57. What is the **volume** of the locker?

- A. 2880 cubic in. B. 2580 cubic in. C. 390 cubic in.
D. 360 cubic in. E. None of the above

58. What is the surface area of the **front** of the locker?

- A. 96 sq. in. B. 240 sq. in. C. 360 sq. in.
D. 696 sq. in. E. None of the above.



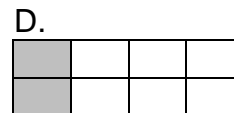
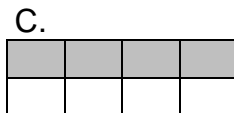
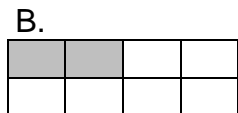
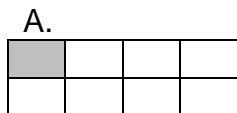
59. Carson needs to purchase 5.6 meters of very expensive tape for a project. If each roll of tape contains 80 cm and costs \$5, what is the **total cost** of the tape that Carson must buy?

- A. \$30 B. \$35 C. \$40 D. \$45 E. None of the above



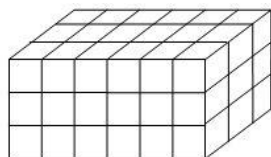
60. Which of the area models below **has the answer shaded** for multiplying the fractions below:

$$\frac{1}{2} \times \frac{1}{4} \quad ?$$



- E. None of the above

61. How many unit cubes will fit inside the box below?



- A. 25 unit cubes B. 34 unit cubes C. 45 unit cubes D. 54 unit cubes
E. None of the above

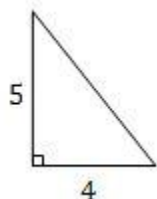
62. All of the following are parallelograms **EXCEPT**:

- A. rectangle B. trapezoid C. square D. rhombus E. All are parallelograms

63. What is the **area of a rectangular garden** that is **5 feet long** and **36 inches wide**?

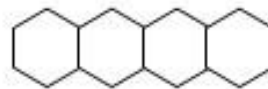
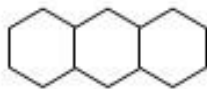
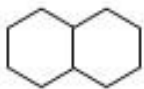
- A. 180 sq. in. B. 180 sq. ft. C. 15 sq. in. D. 15 sq. ft. E. None of the above

64. Calculate the **area** of the right triangle below.



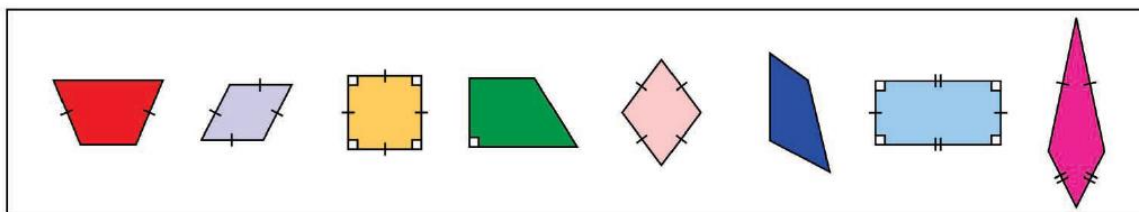
- A. 9 sq. units B. 10 sq. units C. 15 sq. units
D. 20 sq. units E. None of the above

65. Which **pattern of numbers** describes the **number of line segments** needed in the shape pattern listed below?



- A. 1, 2, 3, 4 B. 6, 12, 18, 24 C. 6, 10, 14, 18 D. 6, 11, 16, 21
E. None of the above

66. What is the **best name to describe** all of the figures below?



- A. Parallelograms B. Hexagons C. Rhombi D. Trapezoids E. None of the above

67. How many **pints** are there in a gallon?

- A. 2 B. 4 C. 8 D. 16 E. None of the above

68. How many **ounces** are there in a quart?

- A. 8 oz. B. 12 oz. C. 16 oz. D. 32 oz. E. None of the above

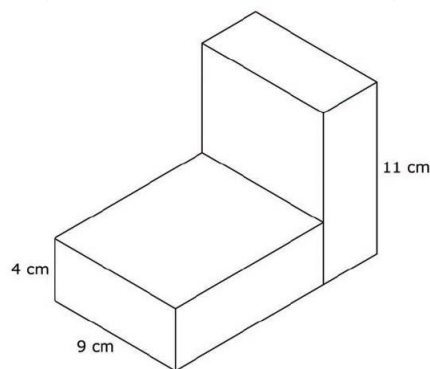
69. How many servings (*please maximize the amount*) of brownies would you get when you cut a 9" by 12" pan of brownies into pieces that are 2 inches by 3 inches?

- A. 24 B. 12 C. 16 D. 18
E None of the above



70. What is the **combined volume** of the two prisms in the figure if both of the rectangular prisms are **congruent cereal boxes**?

- A. 143 cubic in. B. 396 cubic in.
C. 792 cubic in. D. 320 cubic in.
E. None of the above.



Use the same information for problems #71-72.

71. Carolyn created a **square poster** for her book report. The sides were $1\frac{1}{2}$ ft. How much ribbon would she need to make a **border** on the poster?

- A. $1\frac{1}{2}$ ft. B. 6 ft. C. 4 ft. D. 3 ft. E. None of the above

72. How many square feet are in Carolyn's poster board?

- A. 1.5 sq. ft. B. 3 sq. ft. C. 2.25 sq. ft. D. 6 sq. ft. E. None of the above

73. Xian is practicing his long jumps for the track team.

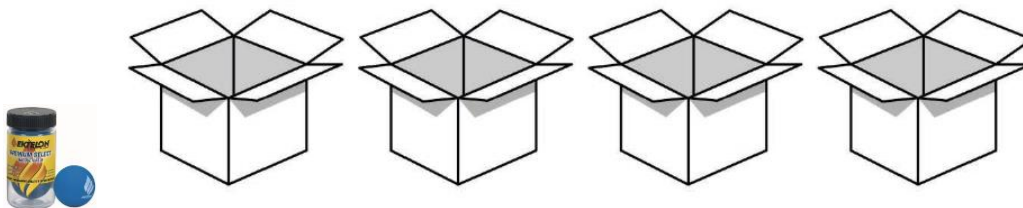
- His first jump measured 3 yards, 1 foot, 2 inches
- His second jump measured 2 yards, 2 feet, 9 inches.

How much farther is Xian's first jump in inches than his second jump?

- A. 15 in. B. 18 in. C. 20 in. D. 17 in. E. None of the above

Use the same information for problems #74-75.

74. You want to fill the 4 boxes below with racket ball cylindrical containers. The cylinders are 2 inches in diameter and 4 inches high. If each box is a **6" by 6" square on the base and 8" in height**, how many of the cylindrical racket ball containers can be packaged in four boxes?

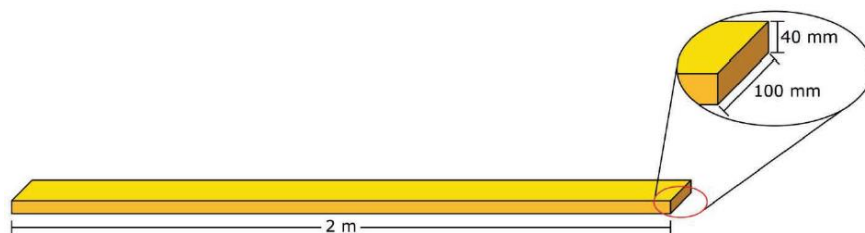


- A. 36 B. 72 C. 144 D. 200 E. None of the above

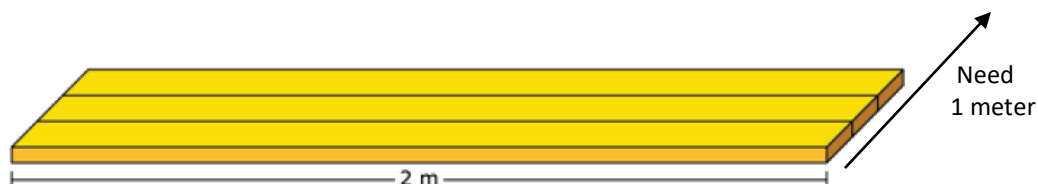
75. If there are **2 balls in every cylinder**, how many racket balls did you package?

- A. 72 B. 288 C. 400 D. 576 E. None of the above

76. Shelbi needs wooden boards to build a platform. Each board is shaped like a rectangular prism with length 2 meters, height 40 mm, and **width 100mm**, as shown below.



To build the platform, Shelbi will place the boards side by side using the width, as shown below. The platform will have a **total width of 1 meter**. How many boards will she need to lay side by side to make the platform?



- A. 10 boards B. 20 boards C. 100 boards D. 120 boards E. None of the above

Use the same information for problems #77.-78.

77. You are measuring your cooking ingredients to make cookies for a bake sale. Forty cookies will be made using a single recipe. The ingredients are listed below in the recipe. You want to **double the recipe**. How much flour and white and brown sugar (the same amount is needed for both) do you need?

Chocolate Chip Cookies
(serves 40 people)

$2\frac{1}{4}$ cups flour
1 teaspoon baking soda
1 teaspoon salt
1 cup butter
 $\frac{3}{4}$ cup white sugar
 $\frac{3}{4}$ cup brown sugar
2 eggs
2 cups chocolate chips

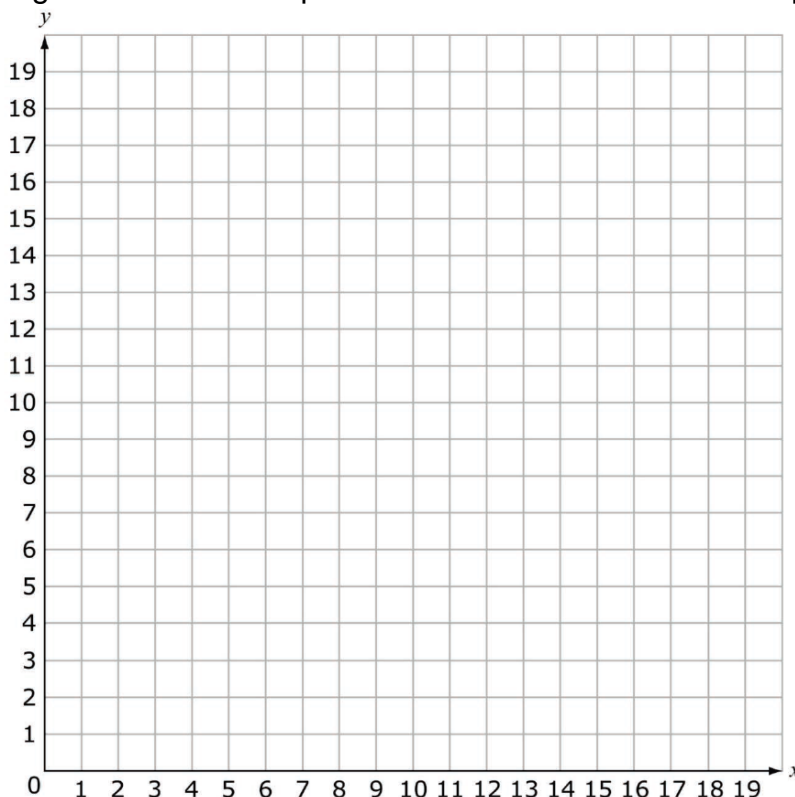
- A. 4 cups flour; 1 $\frac{1}{2}$ cups white and brown sugar
B. 4 $\frac{1}{4}$ cups flour; 1 $\frac{1}{4}$ cups white and brown sugar
C. 4 $\frac{1}{2}$ cups flour; 1 $\frac{1}{2}$ cups white and brown sugar
D. 4 $\frac{1}{2}$ cups flour; 1 $\frac{3}{4}$ cups white and brown sugar
E. None of the above

78. If you were to package 2 cookies in a bag for \$1 to sell at the bake sale, **how many bags** can you make when you double your recipe?

- A. 40 bags B. 80 bags C. 120 bags D. 160 bags E. None of the above

79. One of the corners of a square that is 36 sq. units is placed at (7, 10).

Which of the following is **NOT** a correct placement for the vertices of the square?



- A. Square 1: (1, 10), (1, 4), (7, 4) and (7, 10)
- B. Square 2: (1, 10), (1, 16), (7, 16) and (7, 10)
- C. Square 3: (13, 10), (13, 16), (7, 16) and (7, 10)
- D. Square 4: (13, 10), (13, 4), (7, 4) and (7, 10)
- E. All of the squares would work.

80. Given the following information on your school festival that starts at 11:00, what time will it end when you calculate all of the times listed?

Schedule of Activities

The school festival will start at 11:00 A.M. on Saturday. The list below shows the amounts of time each activity should last.

- Presentation by principal: 30 minutes
- Lunch: $1\frac{1}{2}$ hours
- Student and teacher basketball game: 1 hour
- Band performance: 30 minutes
- Games for prizes: 2 hours
- Break: 15 minutes

- A. 4:30pm
- B. 4:45pm
- C. 5:00pm
- D. 5:15 pm
- E. None of the above

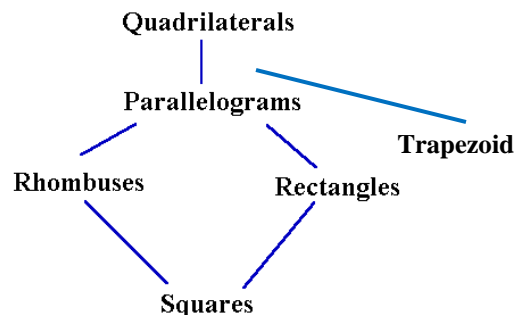
Use the flowchart for problems 81-82:

81. A parallelogram is always, sometimes, or never a rectangle?

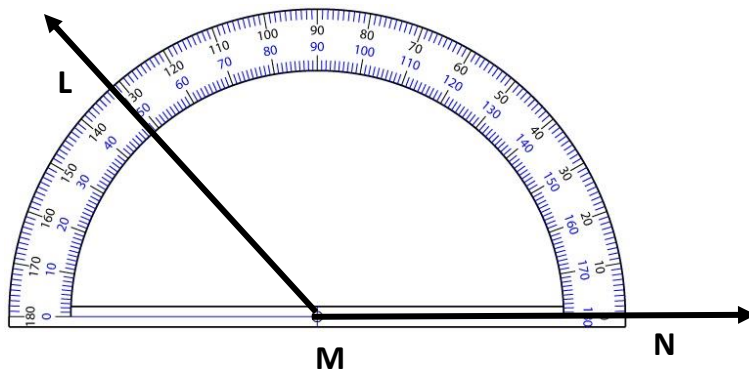
- A. Always B. Sometimes C. Never
D. Not enough information E. None of the above

82. A trapezoid is always, sometimes, or never a square?

- A. Always B. Sometimes C. Never
D. Not enough information E. None of the above

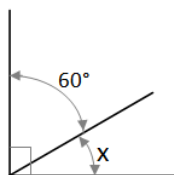


83. What is the measure of the angle $\angle LMN$ marked on the protractor?



- A. 48° B. 52° C. 147° D. 132° E. Not given

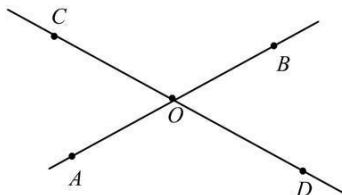
84. What is the measure of the missing angle, x° ?



- A. 30° B. 40°
C. 90° D. 130°
E. None of the above

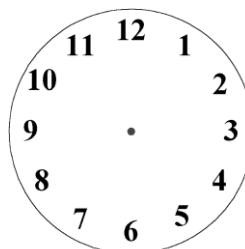
85. What is the measure of $\angle COB$ if the measure of $\angle BOD$ is 72° ?

- A. 18° B. 110°
C. 180° D. 108°
E. None of the above

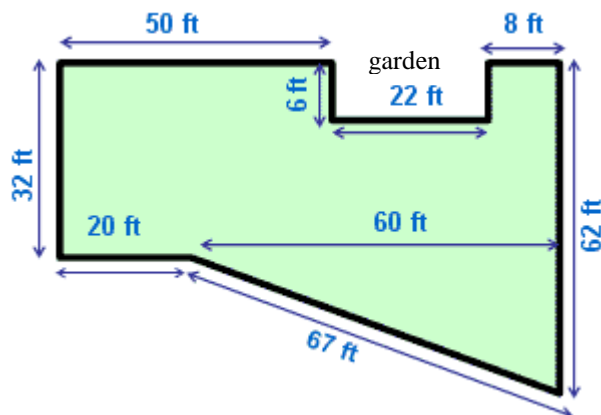


86. The numbers on a clock 30 degrees apart. What is the degree measure of the hands on the clock if they are placed exactly on the 1 and the 5?

- A. 90° B. 120°
C. 150° D. 180° E. Not given



Use this figure of a back yard for problems 87-89.



87. What is the **perimeter** of the backyard (**shaded area**)?

- A. 273 ft. B. 333 ft. C. 327 ft. D. 261 ft. E. None of the above

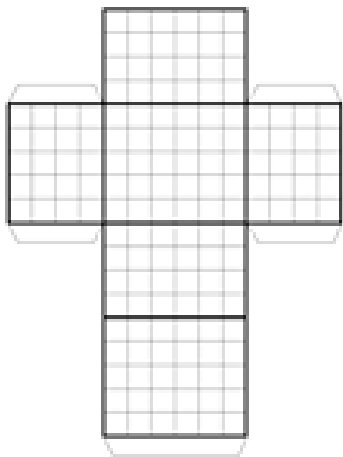
88. If the backyard did NOT have a garden, what would be the **perimeter without the garden**?

- A. 273 ft. B. 267 ft. C. 251 ft. D. 261 ft. E. None of the above

89. Use the information given to find the **area** of the backyard.

- A. 3328 sq. ft. B. 2650 sq. ft. C. 2518 sq. ft. D. 4960 ft. E. None of the above

90. Use the net to find the **total surface area** in sq. units of the prism.



- A. 136 sq. units
B. 148 sq. units
C. 160 sq. units
D. 180 sq. units
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 ☒ B ☐ C ☐ D ☐ E

Name _____

School _____

ANSWER KEY – 3.15.15 JH

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