

Kansas City Area Teachers of Mathematics  
2016 KCATM Contest

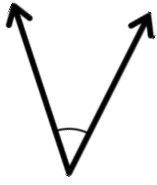
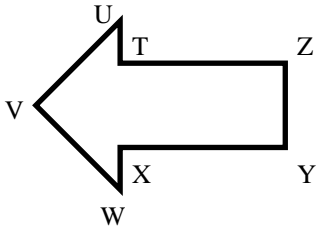




**GEOMETRY AND MEASUREMENT TEST  
GRADE 4**

**INSTRUCTIONS**

- **Do not open this booklet** until instructed to do so.
- Time limit: **15 minutes**
- You **may use calculators** on this test.
- Use **3.14** as the approximation for pi.
- Mark your answer on the answer sheet by **FILLING in the circle.**
- You **may not use rulers, protractors, or other measurement devices** on this test.

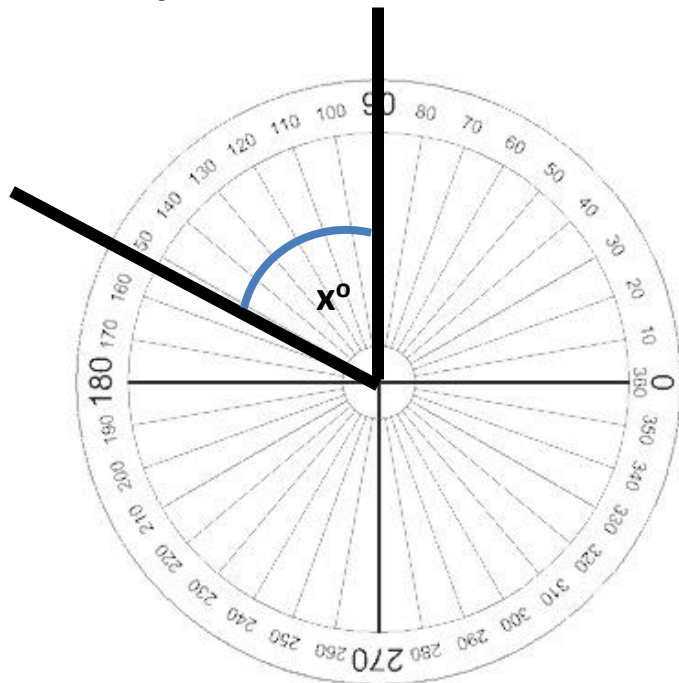
Student Name \_\_\_\_\_ Student Number \_\_\_\_\_

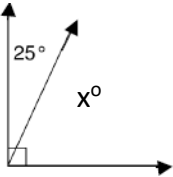
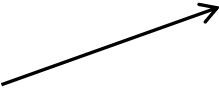


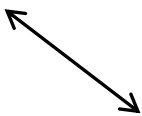



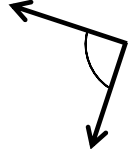
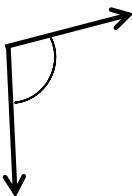
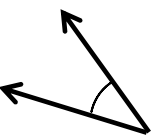
School \_\_\_\_\_

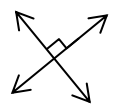
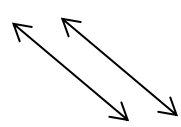
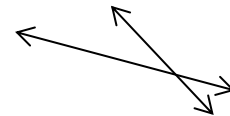
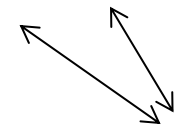
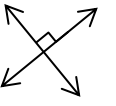
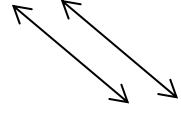
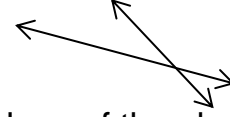
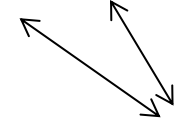
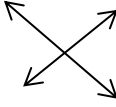
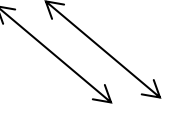

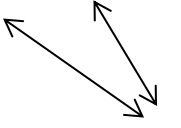
<p>51. What type of angle is shown below?</p> 	<p>A. Obtuse                      B. Acute C. Right                        D. Straight E. None of the above</p>
<p>52. Which line is perpendicular to <math>\overline{TZ}</math>?</p> 	<p>A. <math>\overline{TZ} \perp \overline{YX}</math>            B. <math>\overline{TZ} \perp \overline{VW}</math> C. <math>\overline{TZ} \perp \overline{XY}</math>            D. <math>\overline{TZ} \perp \overline{UV}</math> E. None of the above</p>
<p>53. Which figure shows a straight angle?</p>	<p>A.             B.  C.             D.  E. None of the above</p>

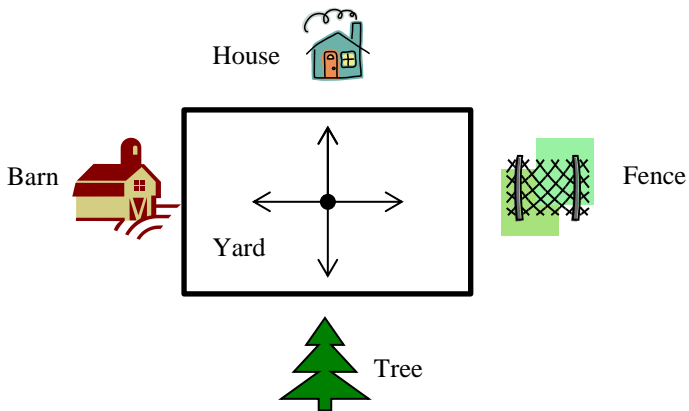
54. What is the approximate measure of the angle marked with the arc,  $x^\circ$ , on the protractor?

- A.  $29^\circ$
- B.  $61^\circ$
- C.  $130^\circ$
- D.  $151^\circ$
- E. None of the above



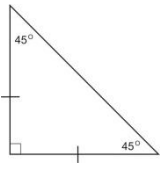
<p>55. What is the measure of the missing angle, <math>x^\circ</math>?</p> 	<p>A. <math>25^\circ</math>                  B. <math>65^\circ</math>                  C. <math>90^\circ</math>                  D. <math>155^\circ</math>                  E. None of the above</p>
<p>56. What is the figure shown below?</p> 	<p>A. Line                  B. Line segment                  C. Ray                  D. Angle                  E. None of the above</p>
<p>57. The hands of the clock form what type of angle?</p> 	<p>A. obtuse                  B. straight                  C. right                  D. acute                  E. None of the above</p>
<p>58. If you stand up, extend your arms straight so that they are parallel with the floor, and then clench both hands into fists, which figure have you created?</p>	<p>A.  B.                   C.  D.                   E. None of the above</p>
<p>59. Which figure on the right could be a right angle?</p>	<p>A.  B.                   C.  D.                   E. None of the above</p>

<p>60. Which pair of lines is <b>parallel</b>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. None of the above</p>
<p>61. Which pair of lines is <b>perpendicular</b>?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. None of the above</p>
<p>62. Which pair of lines <b>never</b> intersect?</p>	<p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. None of the above</p>

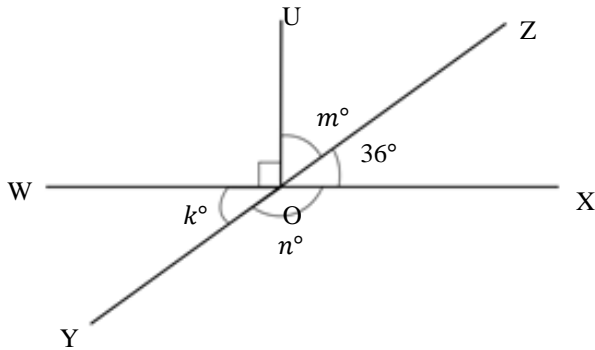


63. **In the picture above**, Jill, Shyan, and Barb stood in the middle of the yard and faced the barn. Jill turned  $90^\circ$  to the right. Shyan turned  $180^\circ$  to the left. Barb turned  $270^\circ$  to the left. **Name the object that Shyan is now facing.**

- A. House
- B. Barn
- C. Fence
- D. Tree
- E. None of the above

<p>64. How could you <b>classify this triangle</b>?</p> <div style="text-align: center;">  </div>	<p>A. Isosceles right triangle                  B. Scalene right triangle                  C. Obtuse isosceles triangle                  D. Acute scalene triangle                  E. None of the above</p>
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**Use the figure below to answer #65-67.**  
 Given: O is the intersection of  $\overline{WX}$ ,  $\overline{YZ}$ , and  $\overline{UO}$ .  
 $m\angle XOZ$  is  $36^\circ$ .



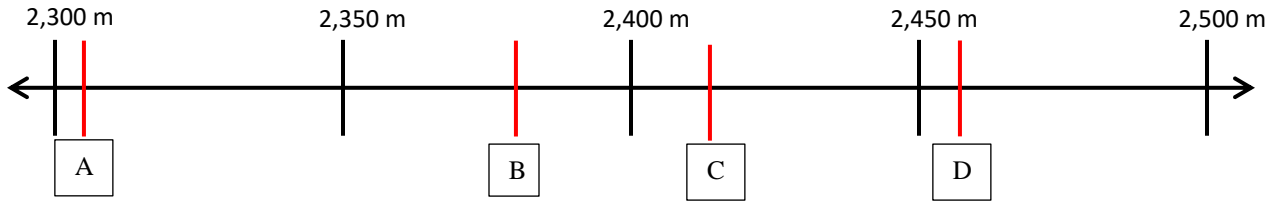
65. What is the **measure of  $k^\circ$** ?
- A.  $k^\circ = 90^\circ$   
 B.  $k^\circ = 144^\circ$   
 C.  $k^\circ = 54^\circ$   
 D.  $k^\circ = 36^\circ$   
 E. None of the above
66. Which equation could be used to find the **measure of  $m^\circ$** ?
- A.  $m^\circ = 180^\circ - 90^\circ$   
 B.  $m^\circ = 90^\circ - 63^\circ$   
 C.  $m^\circ = 180^\circ - 126^\circ$   
 D.  $m^\circ = 360^\circ - 36^\circ - 90^\circ$   
 E. None of the above
67. Select the equation you would use to find the **measure of  $n^\circ$** .
- A.  $n^\circ = 90^\circ - 36^\circ$   
 B.  $n^\circ = 180^\circ - 36^\circ$   
 C.  $n^\circ = 360^\circ - 90^\circ$   
 D.  $n^\circ = 180^\circ - 126^\circ$   
 E. None of the above

68. **Convert the following measurements**, and then **select the set of answers that is listed correct in order of your answers.**

- 1 km = \_\_\_\_\_ m  
 4 km = \_\_\_\_\_ m  
 7 km = \_\_\_\_\_ m  
 \_\_\_\_\_ km = 18,000 m

- A. 500; 2,000; 3,500 and 9  
 B. 1,000; 4,000; 7,000 and 18  
 C. 100; 400; 700 and 180  
 D. 10,000; 40,000; 70,000 and 180  
 E. None of the above

Use the number line below for problems #69-72. Select the letter that represents the value given in each statement.



69. 245,500 cm is **located on the number line approximately at which point?**

- A. A                      B. B                      C. C                      D. D                      E. None of the above

70. 2 km 415 m is **located on the number line approximately at which point?**

- A. A                      B. B                      C. C                      D. D                      E. None of the above

71. 2 km 305 m is **located on the number line approximately at which point?**

- A. A                      B. B                      C. C                      D. D                      E. None of the above

72. 2,379 m is **located on the number line approximately at which point?**

- A. A                      B. B                      C. C                      D. D                      E. None of the above

73. At football practice, the water jug was filled with 18 liters 530 milliliters of water. At the end of practice, there were 795 milliliters left. **How much water did the team drink?**

- A. 7 liters 95 milliliters                      B. 10 liters 58 milliliters  
 C. 18 liters 455 milliliters                      D. 17 liters 735 milliliters  
 E. None of the above

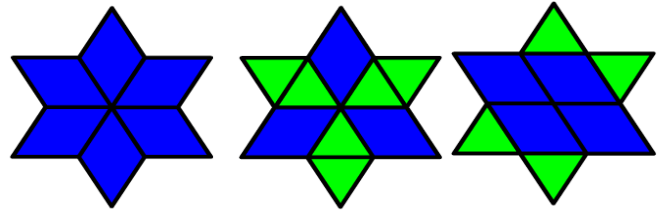
74. Petra’s fish tank contains 9 liters 578 milliliters of water. If the capacity of the tank is 12 liters 455 milliliters of water, **how many more milliliters of water does she need to fill the tank?**

- A. 3,123 mL                      B. 22,033 mL  
 C. 1,836 mL                      D. 2,877 mL                      E. None of the above



Use the information below for problems #75 and #76: *The Quilt-Block History of Pioneer Days* tells the story of how quilts fit into the lives of the pioneers who settle America. **Star quilt patterns are shown outlined below.**

75. Identify the attribute that does **NOT** describe the types of polygons **outlined** in these quilt figures.

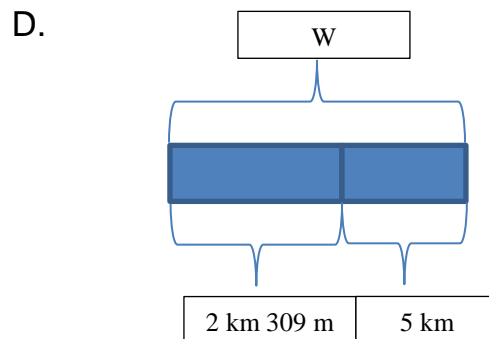
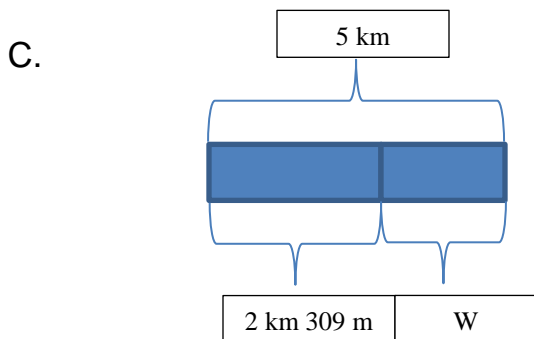
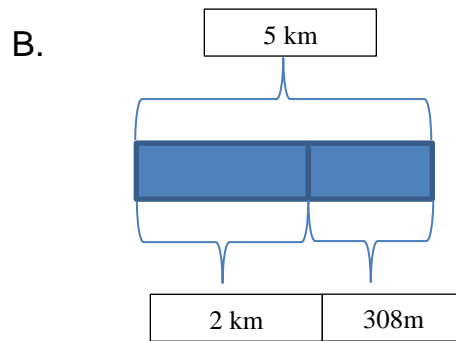
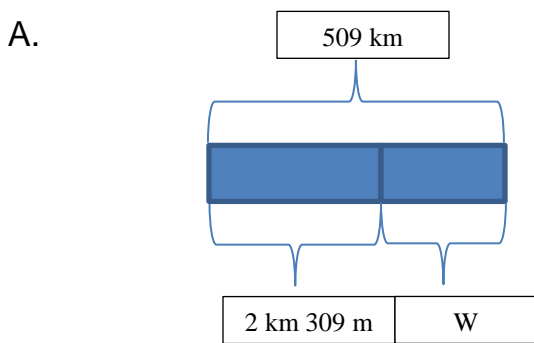


- A. Triangles with equal side lengths show **equilateral triangles**.
- B. Quadrilaterals with two sets of parallel sides show the **parallelograms**.
- C. Quadrilaterals with at least one set of parallel sides show the **trapezoids**.
- D. Quadrilaterals with equal sides show the **rhombuses**.
- E. None of the above.

76. Which decimal value do the 3 quadrilaterals represent in the **middle pattern**?

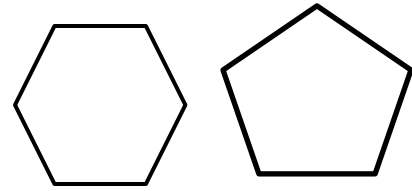
- A. 0.12
- B. 0.50
- C. 0.75
- D. 0.33
- E. None of the above

77. Abby walked 2 km 309 m from school to the store. Then, she walked from the store to her home. If she walked a total of 5 km, **how far was it from the store to her home?** Select the tape diagram that best represents this algorithm when **W = distance walked**.



- E. None of the above

Use the regular polygons for the problems #78-80.



78. Use the pentagon to determine the number of lines of symmetry. What would be the number of **lines of symmetry** in this figure?

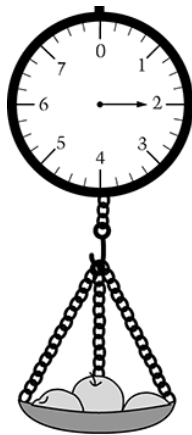
- A. 4    B. 6    C. 5    D. 1    E. None of the above

79. If you were to **add a side to the pentagon**, you then have **what shape**?

- A. hexagon                      B. trapezoid  
C. octagon                      D. rhombus                      E. None of the above

80. **As the number of sides of a polygon increase, the shape gets closer to the appearance of a \_\_\_\_\_ and each interior angle becomes more \_\_\_\_\_.**

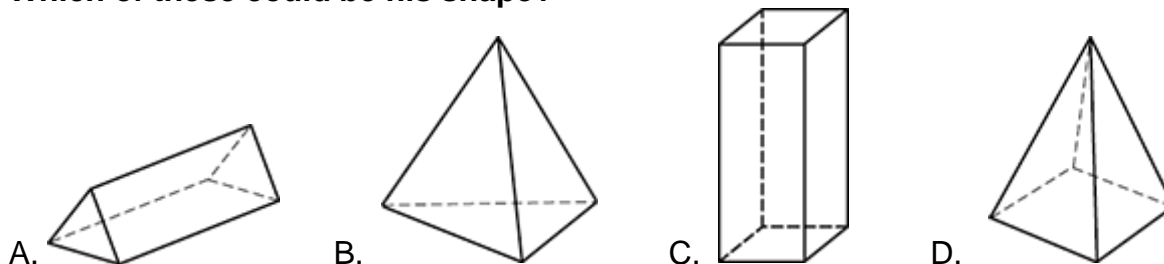
- A. Stop sign,  $135^\circ$                       B. Circle; acute  
C. Line,  $180^\circ$                       D. Circle; obtuse                      E. None of the above



81. How much do these **apples weigh**?

- A. 2 cups  
B. 2 feet  
C. 2 pounds  
D. 2 quarts  
E. None of the above

82. Kyle makes a 3-dimensional shape using 3 rectangles and 2 triangles as the faces. **Which of these could be his shape?**

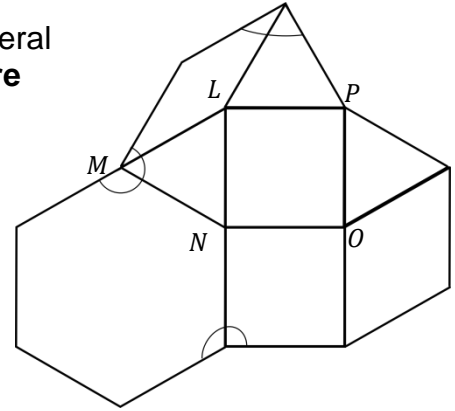


- A.                      B.                      C.                      D.  
E. None of the above



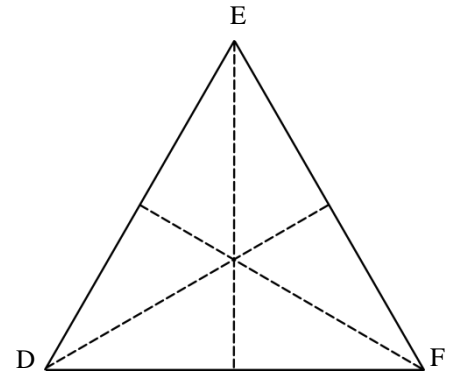
83. Given the compound figure where triangle LMN is equilateral and quadrilateral LNOP is a square. **What is the measure of  $\angle MNO$  ?**

- A.  $150^\circ$
- B.  $160^\circ$
- C.  $180^\circ$
- D.  $90^\circ$
- E. None of the above

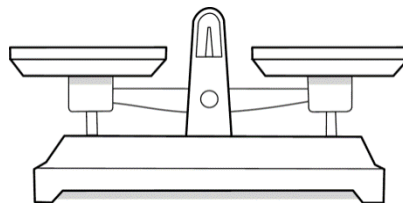


84. If  $\triangle DEF$  is equilateral and has a perimeter of 30 cm, then **what is the length of each side of the triangle?**

- A. 90 cm
- B. 15 cm
- C. 10 cm
- D. 12 cm
- E. None of the above



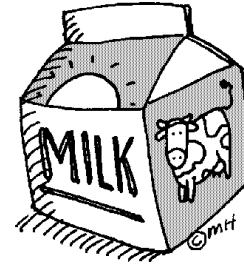
85. Jeff places a pineapple with a mass of 890 grams on a balance scale. **He balances the scale** by placing two oranges, an apple, and a lemon on the other side. Each orange has a mass of 280 grams. The lemon has a mass of 85 grams. **What is the mass of the apple?**



- A. 135 g
- B. 415 g
- C. 610 g
- D. 245 g
- E. None of the above

86. Given that you have 12 quarts in 3 gallons of milk, **what is the rule for converting gallons to quarts?**

- A. Divide the number of gallons by 12.
- B. Multiply the number of gallons by 4.
- C. Multiply the number of quarts by 12.
- D. Divide the number of quarts by 4.
- E. None of the above



87. Susie has 3 quarts of milk. **How many pints does she have?**

- A. 6      B. 12      C. 9      D. 24      E. None of the above

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**Find the following sums and differences for problems #88-90.**

88.  $4 \text{ yd. } 2 \text{ ft.} + 2 \text{ ft.} = \underline{\hspace{2cm}} \text{ yd.} \underline{\hspace{2cm}} \text{ ft.}$

- A. 1 yd., 5 ft.      B. 6 yd., 4 ft.  
C. 5 yd., 2 ft.      D. 5 yd., 1 ft.  
E. None of the above

89.  $6 \text{ yd. } 2 \text{ ft.} + 1 \text{ yd. } 1 \text{ ft.} = \underline{\hspace{2cm}} \text{ yd.} \underline{\hspace{2cm}} \text{ ft.}$

- A. 7 yd., 3 ft.      B. 8 yd., 0 ft.  
C. 8 yd., 3 ft.      D. 5 yd., 1 ft.  
E. None of the above

90.  $7 \text{ yd } 1 \text{ ft} - 5 \text{ yd } 2 \text{ ft} = \underline{\hspace{2cm}} \text{ yd} \underline{\hspace{2cm}} \text{ ft}$

- A. 1 yd., 3 ft.      B. 1 yd., 2 ft.  
C. 2 yd., 2 ft.      D. 1 yd. 1 ft.  
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**

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

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