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 \( \pi \) key on your calculator.

Student Name __________________________  Student Number ________

School ________________________________
Name the relationship: complementary, linear pair, vertical, or adjacent.

51) A) linear pair  
B) alternate interior  
C) adjacent  
D) corresponding  
E) None of the above

52) A) alternate interior  
B) vertical  
C) corresponding  
D) complementary  
E) None of the above

53) A) linear pair  
B) adjacent  
C) vertical  
D) corresponding  
E) None of the above

54) A) complementary  
B) linear pair  
C) alternate exterior  
D) corresponding  
E) None of the above

Use the similar rectangles for problems 55-58.

55) Find CD, the length of the first rectangle.
   A) 40 cm  
   B) 150 cm  
   C) 80 cm  
   D) 96 cm  
   E) None of the above

56) What is the ratio of the width of rectangles to the length of the rectangles?
   A) 1:4  
   B) 3:8  
   C) 3:4  
   D) 1:5  
   E) None of the above

57) What is the ratio of the perimeters of the similar rectangles (small:large)?
   A) 1:5  
   B) 3:8  
   C) 1:25  
   D) 3:10  
   E) None of the above

58) What is the ratio of the areas of the similar rectangles (small:large)?
   A) 3:8  
   B) 9:64  
   C) 1:5  
   D) 1:25  
   E) None of the above
59) On a map, 2.5 inches represents 100 miles. What is the scale factor?

A) 1:4  B) 1:40  C) 50:1  D) 1:50  E) None of the above

Use the line segment on the coordinate plane for problems 60-62.

60) What is the slope of the line segment?

A) 3/4  B) 4/3  C) -3/4  D) -4/3  E) None of the above

61) What is the distance of the line segment? Distance formula: \( d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \)

A) 9 units  B) 10 units  C) 12 units  D) 14 units  E) None of the above

62) Use the segment in the diagram to identify which equation in point-slope form is correct.

A) \( y - 3 = \frac{2}{3}(x + 1) \)  B) \( y + 3 = \frac{3}{4}(x + 1) \)  C) \( y - 5 = -\frac{3}{4}(x - 5) \)
D) \( y + 5 = \frac{4}{3}(x + 5) \)  E) None of the above

63) Find the circumference of a circle with radius 5 cm. Round your answer to the nearest tenth.

A) 15.7 cm  B) 7.9 cm  C) 5 cm  D) 31.4 cm  E) None of the above

64) Given the circumference of a circle is 153.94 meters, what would be the diameter?

A) 15.39 m  B) 49.0 m  C) 51.3 m  D) 31.4 m  E) None of the above

65) What is the area of a circle with radius 8.4 miles? Round to the nearest tenth of a mile.

A) 221.7 sq. miles  B) 52.8 sq. miles  C) 82.9 sq. miles  D) 840 sq. miles  E) None of the above

66) What is the volume of a cube with side measure 9 cm?

A) 54 sq. cm  B) 216 cu. cm  C) 729 cu. cm  D) 486 cu. cm  E) None of the above
Find the value of \(x\).

67) \(112\)°

- A) 37
- B) 36
- C) 34
- D) 31

68) \(31°\)

- A) 19
- B) 10
- C) 14
- D) 16

69) \((3x + 6)^°\)

- A) 12
- B) 6
- C) 11
- D) 9

70) \(206°\)

- A) 62
- B) 57
- C) 61
- D) 59

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71) What is the area of the square shown?

- A) \(4x + 16\)
- B) \(4x + 8\)
- C) \(x^2 + 16\)
- D) \(x^2 + 8x + 16\)
- E) None of the above

72) What is the perimeter of the rectangle below given that the length is twice the width?

- A) \(4x + 20\)
- B) \(6x + 30\)
- C) \(4x + 30\)
- D) \(4x^2 + 20\)
- E) None of the above
73) What is the measure of $\angle DBC$?
   A) 22°  
   B) 13°  
   C) 12°  
   D) 102°  
   E) None of the above

74) You slice through the square pyramid parallel to the base. What shape is the surface of the slice?
   A) triangle  
   B) trapezoid  
   C) rhombus  
   D) square  
   E) None of the above

75) Solve for the unknown angle.

76) Solve for $x$.

77) Solve for the measure of $\angle A$.

78) Solve for $\theta$.

79) Which image is created when you spin a scalene right triangle about one of its legs?
   A) Cone  
   B) Circle  
   C) Sphere  
   D) Rectangle  
   E) None of the above
Find the surface area of each figure. Round your answers to the nearest tenth, if necessary.

80) [Diagram]

A) 498 m²  B) 342 m²  C) 388 m²  D) 278 m²

81) [Diagram]

A) 72 cm²  B) 80 cm²  C) 66 cm²  D) 56 cm²

82) [Diagram]

A) 754 ft²  B) 726.1 ft²  C) 1073.4 ft²  D) 706.3 ft²

83) [Diagram]

A) 289.5 m²  B) 232.6 m²  C) 251.2 m²  D) 236.1 m²

Volume Formulas:

<table>
<thead>
<tr>
<th>Rect. Prism</th>
<th>( V = lwh )</th>
<th>Cone</th>
<th>( V = \frac{1}{3}\pi r^2h )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cylinder</td>
<td>( V = \pi r^2h )</td>
<td>Sphere</td>
<td>( V = \frac{4}{3}\pi r^3 )</td>
</tr>
</tbody>
</table>

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

84) [Diagram]

A) 314.16 mi³  B) 380.64 mi³  C) 352.41 mi³  D) 270.43 mi³

85) [Diagram]

A) 1611.02 m³  B) 1272.35 m³  C) 5089.38 m³  D) 901.69 m³

86) [Diagram]

A) 53 km²  B) 105 km²  C) 140 km²  D) 78 km²

87) [Diagram]

A) 7238.23 ft³  B) 5263.51 ft³  C) 3842.65 ft³  D) 6654.33 ft³
88) What is the **area of a regular hexagon** when given the side length of 8m and the height of each equilateral triangle within the regular hexagon of 6.9m?

![Hexagon Diagram]

A) 41.4 sq. meters  
B) 27.6 sq. meters  
C) 110.4 sq. meters  
D) 165.6 sq. meters  
E) None of the above

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Use the triangle on the coordinate plane for problems 89 and 90.

![Triangle Coordinate Plane]

89) Find the **area** of the triangle.

A) 15 sq. units  
B) 30 sq. units  
C) 48.5 sq. units  
D) 12.5 sq. units  
E) None of the above

90) **Reflect the triangle over the vertical axis**. Name the image coordinates.

A) A’(-5, -1), B’(-2.5, -7), C’ (0, -1)  
B) A’(5, 0), B’(2.5, 6), C’ (0, 0)  
C) A’(5, -1), B’(2.5, -7), C’ (1, 0)  
D) A’(5, 1), B’(2.5,7 ), C’ (0, 1)  
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

Answer Key – 3.19.15 JH

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