

# Answers to Geometry Unit 5 Practice

## LESSON 30-1

- Rectangle; Sample answer: It has four right angles.
  - length: 13 units; width: 9 units
  - $A = bh$
  - 117 units<sup>2</sup>
- 196 units<sup>2</sup>
- Parallelogram; Sample answer: Opposite sides are congruent.
  - $PQ = 12$  units,  $QR = 10$  units,  $RS = 12$  units,  $SP = 10$  units
  - 44 units
  - 96 units<sup>2</sup>
- A
- 104 ft<sup>2</sup>

## LESSON 30-2

- 27.5 units<sup>2</sup>
- $36\sqrt{3}$  or 62.35 cm<sup>2</sup>
  - $16\sqrt{3}$  or 27.71 units<sup>2</sup>
  - $\frac{25\sqrt{3}}{9}$  or 4.81 in.<sup>2</sup>
  - $\frac{49}{\sqrt{3}}$
- D
- $4\sqrt{209}$  or 57.83 cm<sup>2</sup>
- perimeter: 32.97 units; area: 60

## LESSON 30-3

- 108 cm<sup>2</sup>
  - $50\sqrt{2}$  or 70.7 cm<sup>2</sup>
  - $32\sqrt{3}$  or 291.5 in.<sup>2</sup>
  - 70 cm<sup>2</sup>
- 78 cm<sup>2</sup>
  - 63 in.<sup>2</sup>
  - 40 in.<sup>2</sup>
  - 38 units<sup>2</sup>
- 14 in.
- 134.5 units<sup>2</sup>
- C

## LESSON 31-1

- 13
  - $m\angle W = 95^\circ$ ,  $m\angle X = 98^\circ$ ,  $m\angle Y = 81^\circ$ ,  $m\angle Z = 86^\circ$
- C
- 116°
  - 135°
- 70°, 40°
  - 55°, 55°
- 15

## LESSON 31-2

- 30°
  - 12°
  - 6°
- 135°
  - 144°
  - 162°
  - 165°
- D
- 90°
  - 24°
  - 10°
  - 9°
  - 8°
- 38

## LESSON 31-3

- 13.1 cm
  - 12.1 cm
  - 80 cm
  - 484.0 cm<sup>2</sup>
- 9.8 cm
  - 4.2 cm
  - 62.4 cm
  - 308.7 cm<sup>2</sup>
- 6.2 cm
  - 9.1 cm
  - 10.9 cm
  - 396.8 cm<sup>2</sup>

$$\begin{aligned} \text{e. } \frac{\text{area of octagon}}{\text{area of pentagon}} &= \frac{\frac{1}{2}asn}{\frac{1}{2}asn} = \frac{(0.5)(10.9)(9.1)(8)}{(0.5)(6.2)(9.1)(5)} \\ &= \frac{396.76}{141.05} = 2.8 \end{aligned}$$

- C

30. a. side: 20 units; height:  $10\sqrt{3}$  units  
 b.  $5\sqrt{3}$  units  
 c.  $5\sqrt{6}$  units  
 d. 150 units

### LESSON 32-1

31. a.  $10\pi$  cm  
 b.  $25\pi$  cm<sup>2</sup>  
 c.  $10\sqrt{2}\pi$  cm  
 d.  $50\pi$  cm<sup>2</sup>
32. B
33.  $\frac{12}{\sqrt{\pi}}$  or  $\frac{12\sqrt{\pi}}{\pi}$  in.; 6.8 in.
34. a.  $660\pi$  in. or 2073.5 in.  
 b. 289.4 revolutions
35. a.  $47.25\pi$  units<sup>2</sup>                      b.  $9\pi$  units

### LESSON 32.2

36. a.  $6\pi$  in.  
 b.  $60^\circ$   
 c.  $8\pi$  in.  
 d.  $\left(\frac{180}{\pi}\right)^\circ$
37. a. 7.0 cm  
 b.  $\frac{90}{\pi}$  cm = 28.6  
 c.  $\frac{108}{\pi}$  cm = 34.4  
 d.  $\frac{8\pi}{3}$  cm = 8.4
38. a.  $\frac{27\pi}{4}$  cm<sup>2</sup>  
 b.  $\frac{25\pi}{6}$  in.<sup>2</sup>  
 c.  $\frac{800}{\pi}$  cm<sup>2</sup>  
 d.  $\frac{125\pi}{9}$  cm<sup>2</sup>
39. a. 25.1 units<sup>2</sup>  
 b.  $2\pi$  units
40. B

### LESSON 32.3

41. a.  $360^\circ$   
 b.  $22.5^\circ$   
 c.  $18^\circ$   
 d.  $900^\circ$   
 e.  $405^\circ$
42. a.  $\frac{\pi}{4}$   
 b.  $2\pi$   
 c.  $\frac{2\pi}{3}$   
 d.  $\frac{5\pi}{6}$   
 e.  $\frac{3\pi}{2}$
43. a.  $8\pi$  units  
 b. 10 units  
 c. 5 : 2  
 d. 25 : 4
44. D
45. a. Dilate circle *B* by a factor of 1.25.  
 b. Dilate circle *A* by a factor of 0.8.  
 c. 5 : 4  
 d. 25 : 16

### LESSON 33-1

46. a. rectangle  
 b. triangle  
 c. 1 rectangle, 4 triangles  
 d. 5 vertices, 5 faces, 8 edges
47. a. regular pentagon  
 b. rectangle  
 c. 2 regular pentagons, 5 rectangles  
 d. 10 vertices, 7 faces, 15 edges
48. 12
49. B
50. Yes; Sample answer:  $V - E + F = 2$ , so for this polyhedron  $F = 9$ . An octagonal pyramid satisfies these conditions.

## LESSON 33-2

51. C
52. a. a circle  
b. a rectangle  
c. Yes; if the plane is perpendicular to the bases and just touches the curved surface, then the cross section is a segment.  
d. Sample answer: For every plane that intersects the bases and is perpendicular to them, the cross section is a rectangle. Every rectangle has the same height, which is the height of the cylinder. The rectangles have different widths; the greatest width is the diameter of the base, and the cross section has that width if the plane contains the center of the base.
53. The net consists of two congruent circles and a rectangle. The circumference of the circle is the same as the side of the rectangle that it touches.
54. a. point A  
b.  $\overline{XZ}$ ,  $\overline{XW}$ , or  $\overline{XY}$   
c. the length of  $\widehat{ZWY}$   
d.  $BC$
55. a.  $16\pi$  cm  
b.  $16\pi$  cm<sup>2</sup>

## LESSON 33-3

56. a. Yes, the plane contains the center of the sphere.  
b. No, the plane does not contain the center of the sphere.
57. The plane is tangent to the sphere.
58. a. line  $m$   
b. line  $\ell$   
c. line  $n$   
d. line  $p$
59. C
60. a. a cone  
b. the height of the cone  
c. the radius of the base  
d. the slant height

## LESSON 34-1

61. a. 18.8 cm  
b. 18.8 cm by 6 cm  
c. circle:  $28.3$  cm<sup>2</sup>; rectangle:  $112.8$  cm<sup>2</sup>  
d.  $169.4$  cm<sup>2</sup>
62. a. 5 in.  
b. 34 in.  
c.  $170$  in.<sup>2</sup>  
d.  $48$  in.<sup>2</sup>  
e.  $266$  in.<sup>2</sup>
63. a.  $500$  cm<sup>2</sup>  
b.  $620$  cm<sup>2</sup>
64. B
65. a.  $40\pi$  cm<sup>2</sup>  
b.  $400$  cm<sup>2</sup>  
c.  $(100 - 4\pi)$  cm<sup>2</sup>  
d.  $(600 + 32\pi)$  cm<sup>2</sup>

## LESSON 34-2

66.  $343$  m<sup>3</sup>
67.  $320$  in.<sup>3</sup>
68. D
69. a. 5 cm  
b. 20 in.
70. a.  $402.12$  ft<sup>3</sup>  
b. 134 min

## LESSON 35-1

71. C
72. a.  $144\pi$  units<sup>2</sup>  
b.  $180\pi$  units<sup>2</sup>  
c.  $324\pi$  units<sup>2</sup>  
d. 9 units
73. a.  $40\pi$  cm<sup>2</sup>  
b.  $64\pi$  in.<sup>2</sup>  
c.  $64\pi(1 + \sqrt{2})$  cm<sup>2</sup>  
d. 6 cm

74. a.  $4\pi \text{ cm}^2$   
 b.  $40\pi \text{ cm}^2$   
 c.  $2\sqrt{26} \text{ cm}$   
 d.  $4\pi\sqrt{26} \text{ cm}$   
 e.  $(44\pi + 4\pi\sqrt{26}) \text{ cm}^2$

75. a. 4.24 cm  
 b. 79.97  $\text{cm}^2$

### LESSON 35-2

76. D  
 77. a.  $256 \text{ cm}^3$   
 b. slant height: 5 cm; volume:  $48 \text{ cm}^3$   
 c. 7 in.  
 d.  $224 \text{ units}^3$   
 78. a.  $h = 4.5 \text{ cm}$   
 b.  $r = 5.4 \text{ cm}$   
 c.  $\ell = 13.0 \text{ cm}$   
 d.  $136.5 \text{ cm}^2$

79. a. The cone; Sample answer: The heights are equal, and the area of the base of the cone is greater than the area of the base of the pyramid.  
 b.  $(120\pi - 240) \text{ cm}^3$ ;  $137 \text{ cm}^3$

80. D

### LESSON 35-3

81. a.  $43.3 \text{ cm}^3$   
 b. 30.3 g  
 82. a. 3.18 cm  
 b.  $31.77 \text{ cm}^2$   
 c.  $63.5 \text{ cm}^3$   
 d.  $2.7 \text{ g/cm}^3$   
 83. B  
 84.  $38.33 \text{ kg/m}^3$   
 85. a.  $11.5 \text{ kg/m}^3$   
 b. 580 kg  
 c.  $55 \text{ m}^3$   
 d.  $10.55 \text{ kg/m}^3$

### LESSON 36-1

86. A  
 87. a.  $256\pi \text{ in.}^2$ ;  $804.2 \text{ in.}^2$   
 b.  $1600\pi \text{ cm}^2$ ;  $5026.5 \text{ cm}^2$   
 c.  $\frac{9\pi}{4} \text{ in.}^2$  or  $2.25\pi \text{ in.}^2$ ;  $7.1 \text{ in.}^2$   
 d.  $0.04\pi \text{ unit}^2$ ;  $0.1 \text{ unit}^2$   
 88. a.  $196\pi \text{ cm}^2$                       b. 10 cm  
 c.  $10000\pi \text{ units}^2$                       d.  $2\pi \text{ cm}$   
 89. a.  $144\pi \text{ cm}^2$   
 b.  $288\pi \text{ cm}^2$   
 90.  $r = 0.5 \text{ in.}$

### LESSON 36-2

91. 2.9 cm  
 92. a.  $\frac{2048\pi}{3} \text{ cm}^3$   
 b.  $256\pi \text{ cm}^2$   
 c.  $192\pi \text{ cm}^2$   
 93. a. 7.8 in.                                  b. 24.6 in.  
 c.  $48.0 \text{ in.}^2$                                 d.  $191.9 \text{ in.}^2$   
 94. B  
 95. a. cone:  $9\pi \text{ units}^3$ ; hemisphere:  $18\pi \text{ units}^3$ ;  
 cylinder:  $27\pi \text{ units}^3$

- b. 1 : 2  
 c. 2 : 3

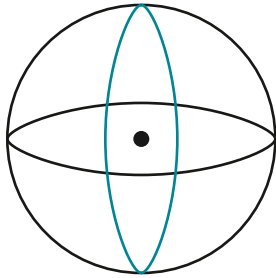
d. The results are the same:  $\frac{\text{vol. cone}}{\text{vol. hemi.}} = \frac{\frac{1}{3}\pi r^3}{\frac{2}{3}\pi r^3} =$

$$\frac{1}{2} \text{ and } \frac{\text{vol. hemi.}}{\text{vol. cyl.}} = \frac{\frac{2}{3}\pi r^3}{\pi r^3} = \frac{\frac{2}{3}\pi r^3}{\frac{3}{3}\pi r^3} = \frac{2}{3}.$$

### LESSON 36-3

96. B  
 97. a. Sample answer: For any other great circle that contains point A, the antipode for A is the “other” intersection of the two great circles.  
 b. Sample answer: If A is one endpoint of a diameter of the sphere, the antipode for A is the other endpoint of that diameter.

98. Sample answer: The term “line” in Euclidean geometry is an undefined term. In spherical geometry, “line” refers to any great circle on a sphere.
99. a. Sample answer: The dashed object is not a great circle so it is not a line in spherical geometry. Since it is not a line, it cannot be considered as “a parallel line” to the great circle.
- b. Sample answer:



100. B

### LESSON 37-1

101. a.  $729 \text{ ft}^3$ ,  $1728 \text{ ft}^3$   
 b.  $27 : 64$   
 c.  $3 : 4$   
 d. Sample answer: The ratio of the volumes is the cube of the ratio of the side lengths.
102. a.  $288\pi \text{ cm}^3$   
 b.  $972\pi \text{ cm}^3$   
 c.  $8 : 27$   
 d. sphere A:  $144\pi \text{ cm}^2$ ; sphere B:  $324\pi \text{ cm}^2$   
 e.  $4 : 9$

103. 23.8 in.
104. a.  $\frac{256\pi}{3} \text{ units}^3$   
 b.  $\frac{4\pi}{3} \text{ units}^3$   
 c.  $64 : 1$   
 d. Sample answer: The radius of the largest sphere is four times the radius of the smallest sphere, and the ratio of the volumes is the cube of the ratio of the radii.

105. D

### LESSON 37-2

106. a.  $2.5\pi \text{ cm}^3$   
 b.  $20\pi \text{ cm}^3$   
 c.  $1 : 8$   
 d. cylinder 1 :  $7\pi \text{ cm}^2$ ; cylinder 2 :  $28\pi \text{ cm}^2$   
 e.  $1 : 4$
107. a. The volume is divided by 4.  
 b. The volume is divided by 2.
108. B
109. a.  $A = 96 \text{ cm}^2$ ;  $V = 64 \text{ cm}^3$   
 b.  $384 \text{ cm}^2$
110. a. The new area is  $\frac{16}{25}$  or 64% of the original area.  
 b. The new volume is  $\frac{64}{125}$  or 51.2% of the original volume.