Chapter 10

10.1.1:

10-6. $V = (6)(5)(8) - \pi(2^2)(8) \approx 139.5 \text{ in}^3$
$SA = 60 + 80 + 96 - 2(2^2)\pi + 4\pi(8) \approx 311.4 \text{ in}^2$

10-7. **a:** $70°$ **b:** $50°$ **c:** $2x$

10-8. She is constructing an angle bisector.

10-9. height $= 6\sqrt{3}$, area $= (15)(6\sqrt{3}) + \frac{1}{6}(144\pi) = 90\sqrt{3} + 24\pi \approx 231.3 \text{ un}^2$,
perimeter $= 15 + 12 + 12 + 15 + \frac{1}{6}(24\pi) = 54 + 4\pi \approx 66.6$ un

10-10. They intersect only once at $(3,5)$.

10-11. A

10.1.1:

10-17. **a:** $64°$ **b:** $128°$ **c:** $64°$ **d:** $180°$ **e:** $128°$ **f:** $52°$

10-18. central angle $= 3.6°$, $A \approx 795.51$ square units

10-19. **a:** $5m + 1 = 3m + 9$, $m = 4$ **b:** $2(x + 4°) = 3x - 9°$, $x = 17°$
c: $(p-2)^2 + 6^2 = p^2$, $p = 10$ **d:** $18t = 360°$, $t = 20°$

10-20. **a:** $D(0,4)$ and $E(4,7)$
b: $DE = 5$ units, so AC should be 10 units long.
c: $\sqrt{6^2 + 8^2} = 10$ units

10-21. **b:** $108°$ **b:** $72°$ **c:** $216°$

10-22. D

10.1.3:

10-28. a: 3 **b:** 6 **c:** 2 **d:** 1 **e:** 4 **f:** 5

10-29. a: They have the same measure.
b: $\overset{\frown}{CD}$, it is a fraction of a circle with a larger diameter.
c: $\frac{60}{360}(28\pi) \approx 14.7$

10-30. $\overline{OY} \cong \overline{KY} \cong \overline{EY} \cong \overline{PY}$ (all radii are congruent), $\measuredangle PYO \cong \measuredangle EYK$ (arc measures are equal), so $\Delta POY \cong \Delta EKY$ (SAS □). Therefore, $\overline{PO} \cong \overline{EK}$ because $\cong \Delta s \rightarrow \cong$ parts.

10-31. It must be a rhombus.

10-32. a: yes, (AA~), $\Delta ABC \sim \Delta LKH$ **b:** not enough information
c: yes, (AA~), $\Delta ABC \sim \Delta EDC$

10-33. C

10.1.4:

10-38. a: 50° **b:** 50° **c:** 67° **d:** 126° **e:** 54° **f:** 63°

10-39. a: $x \approx 31.9°$, $y \approx 10.5$ **b:** $x \approx 3.7$ **c:** $x \approx 34.7°$, $y = \sqrt{250} \approx 15.8$

10-40. a: 4 times **b:** 360 **c:** $360° \div 5 = 72°$

10-41. area of the regular pentagon $\approx 61.9\ \text{ft}^2$; total $SA \approx 2(61.9) + (5)(6)(12) \approx 483.9\ \text{ft}^2$
volume $\approx (61.9)(12) \approx 743.3\ \text{ft}^3$

10-42. a: It is a square. Students should demonstrate that each side is the same length and that two adjacent sides are perpendicular (slopes are opposite reciprocals).
b: C' is at $(-5,-8)$ and D'' is at $(-7,4)$.

10-43. C

10.1.5:

10-48. $MA = 14 + 17 + 6 = 39$, $MB = 6$, so $AB = ER$ and $ER = \sqrt{1485} \approx 38.5$ feet

10-49. $\frac{1}{3} \cdot \frac{1}{6} = \frac{1}{18}$

10-50. $\frac{1}{2}(9)(12) = \frac{1}{2}(20)h,\ h = 5.4"$

10-51. The ratio of the volumes must be $\left(\frac{1}{5}\right)^3$, so the volume must be $\left(\frac{1}{5}\right)^3(500\pi) = 4\pi\ \text{cm}^3$

10-52. **a:** $A \approx 549.78$ sq. cm **b:** $A \approx 74.21$ sq. cm **c:** $A \approx 25.02$ sq. cm

10-53. E

10.2.1:

10-58. **a:** $\frac{1}{6}; \frac{1}{2}$ **b:** $\frac{5}{6}(60) = 50$ times

c: Answers vary, but two squares should have an even number, no numbers can be 3, and all numbers must be less than 5.

10-59. **a:** 13 **b:** 6.5 **c:** $\approx 67.4°$ **d:** $\approx 134.8°$

10-60. **a:** Have Ken's analyzed for $30, and use the ratios of similarity to calculate the data for Erica's nugget themselves.

b: Since $r = 5$, the ratio of the areas is 25. Thus, $110 \cdot 25 = 2750\ \text{cm}^2$.

c: Since $r = 5$, the ratio of the volumes is $5^3 = 125$. Thus, Erica's nugget weighs $125 \cdot 56 = 7000$ g, which is about 14 pounds!

10-61. $2x + 3x + 4x + 5x = 360°,\ x \approx 25.7°$

10-62. If a point makes the inequality true, it must be in the shaded region of the graph.

a: true **b:** false **c:** false **d:** true

10-63. B

10.2.2:

10-69. Region A is $\frac{1}{4}$ of the circle, so it should result $\frac{1}{4}(80) = 20$ times. Regions B and C have equal weight (which can be confirmed with arc measures), so they should each result $(80 - 20) \div 2 = 30$ times.

10-70. a: $\frac{360°}{9} = 40°$

b: $m\overset{\frown}{AD} = 2(97°) = 194°$, $m\measuredangle C = 0.5(194°) = 97°$

c: $m\overset{\frown}{AB} = 125°$ and the length of $\overset{\frown}{AB} = \frac{125°}{360°}(16\pi) \approx 17.5"$;

area $= \frac{125°}{360°}(64\pi) \approx 69.8\ \text{in}^2$

10-71. Methods vary, but a variety of relationships could be used, such as Parallel Line Angle Conjectures, the Exterior Angle Theorem, or the Triangle Sum Theorem; $x = 109°$, $y = 71°$, $z = 99°$

10-72. a: 34 **b:** $\frac{4}{3}$ **c:** -5 **d:** $\frac{32}{5}$

10-73. She is incorrect, which can be tested by substituting both answers into the equation; $w = -6$ or 4.

10-74. A

10.2.3:

10-81. **a:** $\frac{19}{4}$ **b:** 12 **c:** ≈ 4.42

10-82. Note: Equivalent equations can vary, depending on what constant both sides of the equation are multiplied by.

a: one possible equivalent equation: $8x - 3 = 6x$, $x = 1.5$

b: one possible equivalent equation: $7x + 4 = 110$, $x = \frac{106}{7} \approx 15.1$

10-83. **a:** The top & bottom views are the same. Same is true for the right & left views and the front & back views.

b: $V = 7$ un^3, $SA = 28$ un^2; Methods vary.

c: Since this solid has no "holes," the surface area can be calculated by adding the areas of each of the views.

10-84. **b:** $\frac{AB}{AC}$ **c:** $\frac{BC}{AB}$ **d:** $\frac{BC}{AC}$ **e:** $\frac{AB}{AC}$ **f:** $\frac{BC}{AC}$

10-85. **a:** If x represents the length of chord $\overline{AC}$, then $x^2 = 10^2 + 10^2 - 2(10)(10)\cos 80°$; $x \approx 12.9$

b: 18

10-86. C

10.3.1:

10-92. The expected value is $\frac{1}{4}(\$3) + \frac{3}{4}(\$1) = \$1.50$ per spin, so each player should pay \$1.50 so that there is no net gain or loss over many games.

10-93. **a:** $x = y$ **b:** $y = 2x$ or $x = \frac{1}{2}y$ **c:** $3y = 5x$ **d:** $x + y = 180°$

10-94. **a:** yes, because of the Triangle Angle Sum Theorem, $180° - 64° - 26° = 90°$

b: yes, because $8^2 + 15^2 = 17^2$

10-95. $V = (16)(16)(16) = 4096$ un^3; $SA = 6(16)(16) = 1536$ un^2

10-96. **a:** not similar because there are not three pairs of corresponding angles that are congruent

b: similar (AA ~) **c:** similar (SSS ~) **d:** similar (AA ~)

10-97. B