

9. yes
10. $24^2 + 10^2 = 26^2$
 $576 + 100 = 676$
 $676 = 676$: true
11. equilateral
12. yes: they are both radii of the circle
13. 50°
14. $m\angle OAB + m\angle OBA + m\angle AOB = 180^\circ$
 $m\angle OAB + m\angle OBA + 50^\circ = 180^\circ$
 $m\angle OAB + m\angle OBA = 130^\circ$
 $m\angle OAB = 130^\circ \div 2 = 65^\circ$
15. $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$
16. $(\sqrt{6})(-\sqrt{24}) = -\sqrt{144} = -12$
17. $\frac{2\sqrt{15}}{\sqrt{5}} = \frac{2\sqrt{3}}{1} = 2\sqrt{3}$
18. $A = \frac{1}{2}bh = \frac{1}{2}(12)(5\sqrt{6}) = 30\sqrt{6} \text{ in}^2$
 6 triangles
19. $30\sqrt{6}(6) = 180\sqrt{6} \text{ in}^2$
20. $P = 6(12) = 72 \text{ in}$

Systematic Review 18E

1. $6^2 + (2\sqrt{3})^2 = 36 + 4(\sqrt{9}) =$
 $36 + 4(3) = 36 + 12 = 48$
 $\sqrt{48}$ is between 6 and 7
2. $R^2 = 6^2 + (2\sqrt{3})^2$
3. $R^2 = 6^2 + (2\sqrt{3})^2$
 $R^2 = 36 + 4(\sqrt{9})$
 $R^2 = 36 + 4(3)$
 $R^2 = 36 + 12$
 $R^2 = 48$
 $R = \sqrt{48}$
4. $\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$
5. $11^2 + 11^2 = 121 + 121 = 242$
 $\sqrt{242}$ is between 15 and 16
6. $T^2 = 11^2 + 11^2$

7. $T^2 = 11^2 + 11^2$
 $T^2 = 121 + 121$
 $T^2 = 242$
 $T = \sqrt{242} = \sqrt{121}\sqrt{2} = 11\sqrt{2}$
8. $11\sqrt{2} \approx 15.56$
9. yes $(2\sqrt{7})^2 + (2\sqrt{3})^2 = (2\sqrt{10})^2$
 $4\sqrt{49} + 4\sqrt{9} = 4\sqrt{100}$
 $4(7) + 4(3) = 4(10)$
 $28 + 12 = 40$
 $40 = 40$: true
10. The sum of the legs squared equals the hypotenuse squared.
11. yes: It would be a right triangle with equal legs. ($45^\circ - 45^\circ - 90^\circ$)
12. $V = Bh = \pi r^2 h \approx (3.14)(2+3)^2(12)$
 $= 942 \text{ m}^3$
13. $V = Bh = \pi r^2 h \approx (3.14)(2^2)(12)$
 $= 150.72 \text{ m}^3$
14. $V = 942 - 150.72 = 791.28 \text{ m}^3$
15. $5\sqrt{2} - 4\sqrt{3} = 5\sqrt{2} - 4\sqrt{3}$:
 cannot be simplified
16. $(5\sqrt{6})(2\sqrt{10}) =$
 $(5)(2)\sqrt{6}\sqrt{10} = 10\sqrt{60} =$
 $10\sqrt{4}\sqrt{15} = 10(2)(\sqrt{15}) = 20\sqrt{15}$
17. $\frac{\sqrt{100}}{\sqrt{25}} = \frac{\sqrt{4}}{1} = \frac{2}{1} = 2$ or:
 $\frac{\sqrt{100}}{\sqrt{25}} = \frac{10}{5} = 2$
18. $x^2 + 3x - 10 = (x+5)(x-2)$
19. $x^2 - 2x - 3 = (x-3)(x+1)$
20. $x^2 + x - 6 = (x+3)(x-2)$

Lesson Practice 19A

1. $\frac{9}{\sqrt{2}} = \frac{9\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{9\sqrt{2}}{4} = \frac{9\sqrt{2}}{2}$

$$\begin{aligned}
 2. \quad \frac{10}{\sqrt{5}} &= \frac{10\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{10\sqrt{5}}{\sqrt{25}} = \\
 &= \frac{10\sqrt{5}}{5} = \frac{2\sqrt{5}}{1} = 2\sqrt{5} \\
 3. \quad \frac{6}{\sqrt{3}} &= \frac{6\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{6\sqrt{3}}{\sqrt{9}} = \\
 &= \frac{6\sqrt{3}}{3} = \frac{2\sqrt{3}}{1} = 2\sqrt{3} \\
 4. \quad \frac{8}{\sqrt{3}} &= \frac{8\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{8\sqrt{3}}{\sqrt{9}} = \frac{8\sqrt{3}}{3} \\
 5. \quad \frac{15}{\sqrt{5}} &= \frac{15\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{15\sqrt{5}}{\sqrt{25}} = \\
 &= \frac{15\sqrt{5}}{5} = \frac{3\sqrt{5}}{1} = 3\sqrt{5} \\
 6. \quad \frac{9}{\sqrt{3}} &= \frac{9\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{9\sqrt{3}}{\sqrt{9}} = \\
 &= \frac{9\sqrt{3}}{3} = \frac{3\sqrt{3}}{1} = 3\sqrt{3} \\
 7. \quad \frac{3}{\sqrt{2}} + \frac{6}{\sqrt{5}} &= \frac{3\sqrt{2}}{\sqrt{2}\sqrt{2}} + \frac{6\sqrt{5}}{\sqrt{5}\sqrt{5}} = \\
 &= \frac{3\sqrt{2}}{\sqrt{4}} + \frac{6\sqrt{5}}{\sqrt{25}} = \frac{3\sqrt{2}}{2} + \frac{6\sqrt{5}}{5} = \\
 &= \frac{3\sqrt{2}(5)}{2(5)} + \frac{6\sqrt{5}(2)}{5(2)} = \frac{15\sqrt{2}}{10} + \frac{12\sqrt{5}}{10} = \\
 &= \frac{15\sqrt{2} + 12\sqrt{5}}{10} : \text{Note that although 10} \\
 &\text{and 15 have a common factor, and 10} \\
 &\text{and 12 have a common factor, there is} \\
 &\text{no factor that is common to all three} \\
 &\text{terms, so this fraction cannot be} \\
 &\text{reduced.} \\
 &\text{See the next solution for an example} \\
 &\text{of one that can be reduced.} \\
 8. \quad \frac{4}{\sqrt{5}} + \frac{2}{\sqrt{6}} &= \frac{4\sqrt{5}}{\sqrt{5}\sqrt{5}} + \frac{2\sqrt{6}}{\sqrt{6}\sqrt{6}} = \\
 &= \frac{4\sqrt{5}}{\sqrt{25}} + \frac{2\sqrt{6}}{\sqrt{36}} = \frac{4\sqrt{5}}{5} + \frac{2\sqrt{6}}{6} = \\
 &= \frac{4\sqrt{5}(6)}{5(6)} + \frac{2\sqrt{6}(5)}{6(5)} = \frac{24\sqrt{5}}{30} + \frac{10\sqrt{6}}{30} = \\
 &= \frac{24\sqrt{5} + 10\sqrt{6}}{30} = \frac{2(12\sqrt{5} + 5\sqrt{6})}{2(15)} = \\
 &= \frac{12\sqrt{5} + 5\sqrt{6}}{15}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad \frac{4}{\sqrt{2}} + \frac{9}{\sqrt{5}} &= \frac{4\sqrt{2}}{\sqrt{2}\sqrt{2}} + \frac{9\sqrt{5}}{\sqrt{5}\sqrt{5}} = \\
 &= \frac{4\sqrt{2}}{\sqrt{4}} + \frac{9\sqrt{5}}{\sqrt{25}} = \frac{4\sqrt{2}}{2} + \frac{9\sqrt{5}}{5} = \\
 &= \frac{4\sqrt{2}(5)}{2(5)} + \frac{9\sqrt{5}(2)}{5(2)} = \frac{20\sqrt{2}}{10} + \frac{18\sqrt{5}}{10} = \\
 &= \frac{20\sqrt{2} + 18\sqrt{5}}{10} = \frac{2(10\sqrt{2} + 9\sqrt{5})}{2(5)} = \\
 &= \frac{10\sqrt{2} + 9\sqrt{5}}{5} \\
 10. \quad \frac{5}{\sqrt{10}} - \frac{3}{\sqrt{8}} &= \frac{5\sqrt{10}}{\sqrt{10}\sqrt{10}} - \frac{3\sqrt{8}}{\sqrt{8}\sqrt{8}} = \\
 &= \frac{5\sqrt{10}}{\sqrt{100}} - \frac{3\sqrt{8}}{\sqrt{64}} = \frac{5\sqrt{10}}{10} - \frac{3\sqrt{8}}{8} = \\
 &= \frac{\sqrt{10}}{2} - \frac{3\sqrt{8}}{8} = \frac{\sqrt{10}(4)}{2(4)} - \frac{3\sqrt{8}}{8} = \\
 &= \frac{4\sqrt{10}}{8} - \frac{3\sqrt{8}}{8} = \frac{4\sqrt{10} - 3\sqrt{8}}{8} = \\
 &= \frac{4\sqrt{10} - 3\sqrt{4}\sqrt{2}}{8} = \frac{4\sqrt{10} - 3(2)\sqrt{2}}{8} = \\
 &= \frac{2(2\sqrt{10} - 3\sqrt{2})}{2(4)} = \frac{2\sqrt{10} - 3\sqrt{2}}{4} \\
 11. \quad \frac{5}{\sqrt{7}} + \frac{6}{\sqrt{2}} &= \frac{5\sqrt{7}}{\sqrt{7}\sqrt{7}} + \frac{6\sqrt{2}}{\sqrt{2}\sqrt{2}} = \\
 &= \frac{5\sqrt{7}}{\sqrt{49}} + \frac{6\sqrt{2}}{\sqrt{4}} = \frac{5\sqrt{7}}{7} + \frac{6\sqrt{2}}{2} = \\
 &= \frac{5\sqrt{7}(2)}{7(2)} + \frac{6\sqrt{2}(7)}{2(7)} = \\
 &= \frac{10\sqrt{7}}{14} + \frac{42\sqrt{2}}{14} = \frac{10\sqrt{7} + 42\sqrt{2}}{14} = \\
 &= \frac{2(5\sqrt{7} + 21\sqrt{2})}{2(7)} = \frac{5\sqrt{7} + 21\sqrt{2}}{7} \\
 12. \quad \frac{5\sqrt{2}}{\sqrt{3}} - \frac{4\sqrt{3}}{\sqrt{5}} &= \frac{5\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}} - \frac{4\sqrt{3}\sqrt{5}}{\sqrt{5}\sqrt{5}} = \\
 &= \frac{5\sqrt{6}}{\sqrt{9}} - \frac{4\sqrt{15}}{\sqrt{25}} = \frac{5\sqrt{6}}{3} - \frac{4\sqrt{15}}{5} = \\
 &= \frac{5\sqrt{6}(5)}{3(5)} - \frac{4\sqrt{15}(3)}{5(3)} = \\
 &= \frac{25\sqrt{6}}{15} - \frac{12\sqrt{15}}{15} = \frac{25\sqrt{6} - 12\sqrt{15}}{15} \\
 13. \quad &\text{denominator} \\
 14. \quad &\text{one} \\
 15. \quad &\text{denominator; common}
 \end{aligned}$$

Lesson Practice 19B

1. $\frac{11\sqrt{5}}{\sqrt{5}} = \frac{11}{1} = 11$
2. $\frac{18}{\sqrt{2}} = \frac{18\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{18\sqrt{2}}{\sqrt{4}} = \frac{18\sqrt{2}}{2} = \frac{9\sqrt{2}}{1} = 9\sqrt{2}$
3. $\frac{12}{\sqrt{6}} = \frac{12\sqrt{6}}{\sqrt{6}\sqrt{6}} = \frac{12\sqrt{6}}{\sqrt{36}} = \frac{12\sqrt{6}}{6} = \frac{2\sqrt{6}}{1} = 2\sqrt{6}$
4. $\frac{7}{\sqrt{2}} = \frac{7\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{7\sqrt{2}}{\sqrt{4}} = \frac{7\sqrt{2}}{2}$
5. $\frac{6}{\sqrt{3}} = \frac{6\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{6\sqrt{3}}{\sqrt{9}} = \frac{6\sqrt{3}}{3} = \frac{2\sqrt{3}}{1} = 2\sqrt{3}$
6. $\frac{9\sqrt{6}}{\sqrt{5}} = \frac{9\sqrt{6}\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{9\sqrt{30}}{\sqrt{25}} = \frac{9\sqrt{30}}{5}$
7. $\frac{4\sqrt{7}}{\sqrt{2}} + \frac{3\sqrt{7}}{\sqrt{2}} = \frac{4\sqrt{7} + 3\sqrt{7}}{\sqrt{2}} = \frac{7\sqrt{7}}{\sqrt{2}} = \frac{7\sqrt{7}\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{7\sqrt{14}}{\sqrt{4}} = \frac{7\sqrt{14}}{2}$
8. $\frac{\sqrt{12}}{9} - \frac{\sqrt{18}}{4} = \frac{\sqrt{4}\sqrt{3}}{9} - \frac{\sqrt{9}\sqrt{2}}{4} = \frac{2\sqrt{3}}{9} - \frac{3\sqrt{2}}{4} = \frac{2\sqrt{3}(4)}{9(4)} - \frac{3\sqrt{2}(9)}{4(9)} = \frac{8\sqrt{3}}{36} - \frac{27\sqrt{2}}{36} = \frac{8\sqrt{3} - 27\sqrt{2}}{36}$
9. $\frac{5}{\sqrt{2}} + \frac{7}{\sqrt{8}} = \frac{5\sqrt{2}}{\sqrt{2}\sqrt{2}} + \frac{7\sqrt{8}}{\sqrt{8}\sqrt{8}} = \frac{5\sqrt{2}}{\sqrt{4}} + \frac{7\sqrt{8}}{\sqrt{64}} = \frac{5\sqrt{2}}{2} + \frac{7\sqrt{8}}{8} = \frac{5\sqrt{2}}{2} + \frac{7\sqrt{4}\sqrt{2}}{8} = \frac{5\sqrt{2}}{2} + \frac{7(2)\sqrt{2}}{8} = \frac{5\sqrt{2}(2)}{2(2)} + \frac{7\sqrt{2}}{4} = \frac{10\sqrt{2}}{4} + \frac{7\sqrt{2}}{4} = \frac{17\sqrt{2}}{4}$

10. $\frac{8\sqrt{3}}{\sqrt{2}} - \frac{5\sqrt{6}}{\sqrt{5}} = \frac{8\sqrt{3}\sqrt{2}}{\sqrt{2}\sqrt{2}} - \frac{5\sqrt{6}\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{8\sqrt{6}}{\sqrt{4}} - \frac{5\sqrt{30}}{\sqrt{25}} = \frac{8\sqrt{6}(5)}{2(5)} - \frac{5\sqrt{30}(2)}{5(2)} = \frac{40\sqrt{6}}{10} - \frac{10\sqrt{30}}{10} = \frac{40\sqrt{6} - 10\sqrt{30}}{10} = \frac{10(4\sqrt{6} - \sqrt{30})}{10(1)} = 4\sqrt{6} - \sqrt{30}$
11. $\frac{3}{\sqrt{5}} + \frac{7}{\sqrt{2}} = \frac{3\sqrt{5}}{\sqrt{5}\sqrt{5}} + \frac{7\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{3\sqrt{5}}{\sqrt{25}} + \frac{7\sqrt{2}}{\sqrt{4}} = \frac{3\sqrt{5}}{5} + \frac{7\sqrt{2}}{2} = \frac{3\sqrt{5}(2)}{5(2)} + \frac{7\sqrt{2}(5)}{2(5)} = \frac{6\sqrt{5}}{10} + \frac{35\sqrt{2}}{10} = \frac{6\sqrt{5} + 35\sqrt{2}}{10}$
12. $\frac{4\sqrt{11}}{\sqrt{3}} + \frac{2\sqrt{5}}{\sqrt{7}} = \frac{4\sqrt{11}\sqrt{3}}{\sqrt{3}\sqrt{3}} + \frac{2\sqrt{5}\sqrt{7}}{\sqrt{7}\sqrt{7}} = \frac{4\sqrt{33}}{\sqrt{9}} + \frac{2\sqrt{35}}{\sqrt{49}} = \frac{4\sqrt{33}}{3} + \frac{2\sqrt{35}}{7} = \frac{4\sqrt{33}(7)}{3(7)} + \frac{2\sqrt{35}(3)}{7(3)} = \frac{28\sqrt{33}}{21} + \frac{6\sqrt{35}}{21} = \frac{28\sqrt{33} + 6\sqrt{35}}{21}$
13. one
14. radical or square root
15. common denominator

Systematic Review 19C

1. $\frac{6}{\sqrt{7}} = \frac{6\sqrt{7}}{\sqrt{7}\sqrt{7}} = \frac{6\sqrt{7}}{\sqrt{49}} = \frac{6\sqrt{7}}{7}$
2. $\frac{8}{\sqrt{2}} = \frac{8\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{8\sqrt{2}}{\sqrt{4}} = \frac{8\sqrt{2}}{2} = \frac{4\sqrt{2}}{1} = 4\sqrt{2}$
3. $\frac{6\sqrt{2}}{\sqrt{3}} = \frac{6\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{6\sqrt{6}}{\sqrt{9}} = \frac{6\sqrt{6}}{3} = 2\sqrt{6}$
4. $2\sqrt{3} + 6\sqrt{2} = 2\sqrt{3} + 6\sqrt{2}$
cannot be simplified

$$\begin{aligned}
 5. \quad & (4\sqrt{3})(7\sqrt{15}) = \\
 & (4)(7)\sqrt{3}\sqrt{15} = 28\sqrt{45} = \\
 & 28\sqrt{9}\sqrt{5} = 28(3)\sqrt{5} = 84\sqrt{5} \\
 6. \quad & \frac{\sqrt{36}}{\sqrt{6}} = \frac{\sqrt{6}}{1} = \sqrt{6} \\
 7. \quad & \frac{10\sqrt{10}}{\sqrt{7}} - \frac{2\sqrt{6}}{\sqrt{11}} = \\
 & \frac{10\sqrt{10}\sqrt{7}}{\sqrt{7}\sqrt{7}} - \frac{2\sqrt{6}\sqrt{11}}{\sqrt{11}\sqrt{11}} = \\
 & \frac{10\sqrt{70}}{\sqrt{49}} - \frac{2\sqrt{66}}{\sqrt{121}} = \frac{10\sqrt{70}}{7} - \frac{2\sqrt{66}}{11} = \\
 & \frac{10\sqrt{70}(11)}{7(11)} - \frac{2\sqrt{66}(7)}{11(7)} = \\
 & \frac{110\sqrt{70}}{77} - \frac{14\sqrt{66}}{77} = \\
 & \frac{110\sqrt{70} - 14\sqrt{66}}{77} \\
 8. \quad & \frac{24\sqrt{13}}{\sqrt{3}} + \frac{3\sqrt{2}}{\sqrt{3}} = \frac{24\sqrt{13}\sqrt{3}}{\sqrt{3}\sqrt{3}} + \frac{3\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}} = \\
 & \frac{24\sqrt{39}}{\sqrt{9}} + \frac{3\sqrt{6}}{\sqrt{9}} = \frac{24\sqrt{39}}{3} + \frac{3\sqrt{6}}{3} = \\
 & \frac{24\sqrt{39} + 3\sqrt{6}}{3} = \frac{3(8\sqrt{39} + \sqrt{6})}{3(1)} = \\
 & 8\sqrt{39} + \sqrt{6}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & 5^2 + 10^2 = 25 + 100 = 125 \\
 & \sqrt{125} \text{ is between } 11 \text{ and } 12 \\
 10. \quad & 5^2 + 10^2 = Q^2 \\
 11. \quad & 5^2 + 10^2 = Q^2 \\
 & 25 + 100 = Q^2 \\
 & 125 = Q^2 \\
 & \sqrt{125} = Q = \sqrt{25}\sqrt{5} = 5\sqrt{5} \\
 12. \quad & \text{guess about } 12 \\
 13. \quad & x^2 + 16^2 = 20^2 \\
 & x^2 + 256 = 400 \\
 & x^2 = 144 \\
 14. \quad & x^2 + 16^2 = 20^2 \\
 & x^2 + 256 = 400 \\
 & x^2 = 144 \\
 & x = 12
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & V = \frac{1}{3}Bh = \frac{1}{3}\pi r^2 h \approx \\
 & \frac{1}{3}(3.14)(11^2)(14.3) = 1,811.05 \text{ in}^3 \\
 16. \quad & \text{check with ruler and protractor} \\
 17. \quad & \text{The measures of the angles of a} \\
 & \text{quadrilateral add up to } 360^\circ. \text{ In a} \\
 & \text{rhombus, opposite angles are} \\
 & \text{congruent, because they are} \\
 & \text{formed by transversals cutting} \\
 & \text{parallel lines. If two of the angles} \\
 & \text{measure } 60^\circ, \text{ then the other two} \\
 & \text{would be:} \\
 & 360^\circ - (2 \times 60^\circ) = \\
 & 360^\circ - 120^\circ = 240^\circ \\
 & \text{If they add up to } 240^\circ, \text{ and are} \\
 & \text{equal, then each must have a} \\
 & \text{measure of:} \\
 & 240^\circ \div 2 = 120^\circ \\
 18. \quad & A = \frac{1}{2}bh = \frac{1}{2}(5)(3\sqrt{2}) = 7.5\sqrt{2} \text{ in}^2 \\
 & 8 \text{ triangles} \\
 19. \quad & (8)(7.5\sqrt{2}) = 60\sqrt{2} \text{ in}^2 \\
 20. \quad & P = 8(5) = 40 \text{ in}
 \end{aligned}$$

Systematic Review 19D

$$\begin{aligned}
 1. \quad & \frac{9}{\sqrt{5}} = \frac{9\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{9\sqrt{5}}{\sqrt{25}} = \frac{9\sqrt{5}}{5} \\
 2. \quad & \frac{6}{\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{6\sqrt{2}}{\sqrt{4}} = \frac{6\sqrt{2}}{2} = 3\sqrt{2} \\
 3. \quad & \frac{5\sqrt{10}}{\sqrt{6}} = \frac{5\sqrt{10}\sqrt{6}}{\sqrt{6}\sqrt{6}} = \frac{5\sqrt{60}}{\sqrt{36}} = \frac{5\sqrt{60}}{6} = \\
 & \frac{5\sqrt{4}\sqrt{15}}{6} = \frac{5(2)\sqrt{15}}{6} = \frac{5\sqrt{15}}{3} \\
 4. \quad & 5\sqrt{6} + 2\sqrt{10} = 5\sqrt{6} + 2\sqrt{10}: \\
 & \text{cannot be simplified} \\
 5. \quad & (3\sqrt{8})(2\sqrt{5}) = (3)(2)\sqrt{8}\sqrt{5} = 6\sqrt{40} = \\
 & 6\sqrt{4}\sqrt{10} = 6(2)\sqrt{10} = 12\sqrt{10} \\
 6. \quad & \frac{2\sqrt{14}}{\sqrt{7}} = \frac{2\sqrt{2}}{1} = 2\sqrt{2}
 \end{aligned}$$

7. $\frac{2\sqrt{5}}{\sqrt{6}} + \frac{2\sqrt{2}}{\sqrt{3}} = \frac{2\sqrt{5}\sqrt{6}}{\sqrt{6}\sqrt{6}} + \frac{2\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}} =$
 $\frac{2\sqrt{30}}{\sqrt{36}} + \frac{2\sqrt{6}}{\sqrt{9}} = \frac{2\sqrt{30}}{6} + \frac{2\sqrt{6}}{3} =$
 $\frac{\sqrt{30}}{3} + \frac{2\sqrt{6}}{3} = \frac{\sqrt{30} + 2\sqrt{6}}{3}$
8. $\frac{5\sqrt{11}}{\sqrt{2}} - \frac{3\sqrt{5}}{\sqrt{2}} = \frac{5\sqrt{11}\sqrt{2}}{\sqrt{2}\sqrt{2}} - \frac{3\sqrt{5}\sqrt{2}}{\sqrt{2}\sqrt{2}} =$
 $\frac{5\sqrt{22}}{\sqrt{4}} - \frac{3\sqrt{10}}{\sqrt{4}} = \frac{5\sqrt{22}}{2} - \frac{3\sqrt{10}}{2} =$
 $\frac{5\sqrt{22} - 3\sqrt{10}}{2}$
9. $9^2 + 11^2 = x^2$
10. $9^2 + 11^2 = x^2$
 $81 + 121 = x^2$
 $202 = x^2$
 $\sqrt{202} = x \approx 14.21 \text{ units}$
11. $A = \frac{1}{2}bh = \frac{1}{2}(9)(11) = 49.5 \text{ units}^2$
12. $L^2 + 5^2 = 13^2$
13. $L^2 + 5^2 = 13^2$
 $L^2 + 25 = 169$
 $L^2 = 144$
 $L = 12 \text{ units}$
14. $A = \frac{1}{2}bh = \frac{1}{2}(5)(12) = 30 \text{ units}^2$
15. check with protractor
16. 45° : check with protractor
17. $A = \frac{1}{2}(7) \times \frac{1}{2}(5) \times \pi \approx$
 $(3.5)(2.5)(3.14) \approx 27.48 \text{ m}^2$
18. $A = \pi r^2 \approx (3.14)(3)^2 = 28.26 \text{ in}^2$
19. $\frac{90^\circ}{360^\circ} = \frac{1}{4}$
20. $A = \frac{1}{4}(28.26) = (.25)(28.26) \approx 7.07 \text{ in}^2$

Systematic Review 19E

1. $\frac{2\sqrt{6}}{2\sqrt{5}} = \frac{\sqrt{6}}{\sqrt{5}} = \frac{\sqrt{6}\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{\sqrt{30}}{\sqrt{25}}$
2. $\frac{\sqrt{5}}{\sqrt{10}} = \frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{\sqrt{2}}{\sqrt{4}}$
3. $\frac{12\sqrt{13}}{2\sqrt{13}} = \frac{12}{2} = 6$
4. $8\sqrt{2} + 2\sqrt{14} = 8\sqrt{2} + 2\sqrt{14}$:
cannot be simplified
5. $(2\sqrt{7})(5\sqrt{8}) = (2)(5)\sqrt{7}\sqrt{8} =$
 $10\sqrt{56} = 10\sqrt{4\sqrt{14}} =$
 $10(2)\sqrt{14} = 20\sqrt{14}$
6. $\frac{14}{\sqrt{7}} = \frac{14\sqrt{7}}{\sqrt{7}\sqrt{7}} = \frac{14\sqrt{7}}{\sqrt{49}} = \frac{14\sqrt{7}}{7} =$
 $\frac{2\sqrt{7}}{1} = 2\sqrt{7}$
7. $\frac{15}{\sqrt{5}} + \frac{20}{\sqrt{2}} = \frac{15\sqrt{5}}{\sqrt{5}\sqrt{5}} + \frac{20\sqrt{2}}{\sqrt{2}\sqrt{2}} =$
 $\frac{15\sqrt{5}}{\sqrt{25}} + \frac{20\sqrt{2}}{\sqrt{4}} = \frac{15\sqrt{5}}{5} + \frac{20\sqrt{2}}{2} =$
 $3\sqrt{5} + 10\sqrt{2}$
8. $\frac{5\sqrt{2}}{\sqrt{14}} - \frac{3\sqrt{2}}{\sqrt{14}} = \frac{5\sqrt{2} - 3\sqrt{2}}{\sqrt{14}} = \frac{2\sqrt{2}}{\sqrt{14}} =$
 $\frac{2\sqrt{2}\sqrt{14}}{\sqrt{14}\sqrt{14}} = \frac{2\sqrt{28}}{\sqrt{196}} = \frac{2\sqrt{28}}{14} =$
 $\frac{\sqrt{28}}{7} = \frac{\sqrt{4}\sqrt{7}}{7} = \frac{2\sqrt{7}}{7}$
9. $5^2 + 6^2 = x^2$
10. $5^2 + 6^2 = x^2$
 $25 + 36 = x^2$
 $61 = x^2$
 $\sqrt{61} = x^2 \approx 7.81 \text{ units}$
11. $A = \frac{1}{2}(5)(6) = 15 \text{ units}^2$
12. $B^2 + (2B)^2 = x^2$

$$\begin{aligned}
 13. \quad B^2 + (2B)^2 &= X^2 \\
 B^2 + (2B)(2B) &= X^2 \\
 B^2 + 4B^2 &= X^2 \\
 5B^2 &= X^2 \\
 \sqrt{5B^2} &= X \\
 X &= \sqrt{B^2} \sqrt{5} = B\sqrt{5} \text{ units}
 \end{aligned}$$

$$14. \quad A = \frac{1}{2}bh = \frac{1}{2}(B)(2B) = B^2 \text{ units}^2$$

$$15. \quad A = \pi r^2 \approx (3.14)(4^2) = 50.24 \text{ in}^2$$

$$16. \quad \text{sector is } \frac{45^\circ}{360^\circ} = \frac{1}{8} \text{ of the circle}$$

$$\begin{aligned}
 17. \quad A &= \frac{1}{8}(50.24) \\
 &= (.125)(50.24) \approx 6.28 \text{ in}^2
 \end{aligned}$$

$$18. \quad 9\frac{1}{2} = \sqrt{9} = 3$$

$$19. \quad 1,000\frac{2}{3} = \sqrt[3]{1,000}^2 = 10^2 = 100$$

$$20. \quad 4\frac{3}{2} = (\sqrt{4})^3 = 2^3 = 8$$

Lesson Practice 20A

1. 90° ; 45°
2. isosceles
3. hypotenuse
4. equal
5. Pythagorean
6. $\sqrt{2}$
7. $7\sqrt{2}$
8. 7
9. $5\sqrt{2}$
10. 5
11. $3\sqrt{2}$
12. $3\sqrt{2}\sqrt{2} = 3\sqrt{4} = 3(2) = 6$
13. $\frac{8\sqrt{2}}{\sqrt{2}} = \frac{8}{1} = 8$
14. 8

15. Since ABCD is a square, all four sides are equal in length. Therefore, $\triangle ABD$ has two congruent sides, and is a $45^\circ - 45^\circ - 90^\circ$ triangle.
 $10\sqrt{2}$

Lesson Practice 20B

1. false
2. false
3. true
4. true
5. false
6. true
7. $8\sqrt{2}$
8. 8
9. $6\sqrt{3}\sqrt{2} = 6\sqrt{6}$
10. $6\sqrt{3}$
11. $\frac{5\sqrt{2}}{\sqrt{2}} = \frac{5}{1} = 5$
12. 5
13. $\frac{10}{\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{4}} = \frac{10\sqrt{2}}{2} = \frac{5\sqrt{2}}{1} = 5\sqrt{2}$
14. $5\sqrt{2}$
15. $\frac{14}{\sqrt{2}} = \frac{14\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{14\sqrt{2}}{\sqrt{4}} = \frac{14\sqrt{2}}{2} = \frac{7\sqrt{2}}{1} = 7\sqrt{2} \text{ cm}$

Systematic Review 20C

1. $5\sqrt{2}$
2. 5
3. $\frac{20\sqrt{2}}{\sqrt{2}} = \frac{20}{1} = 20$
4. 20

5. $H^2 = 3^2 + 7^2$
 $H^2 = 9 + 49$
 $H^2 = 58$
 $H = \sqrt{58}$
6. $(11\sqrt{40})(9\sqrt{5}) = (11)(9)\sqrt{40}\sqrt{5}$
 $= 99\sqrt{200} = 99\sqrt{100}\sqrt{2} =$
 $99(10)\sqrt{2} = 990\sqrt{2}$
7. $(2\sqrt{6})(10\sqrt{8}) = (2)(10)\sqrt{6}\sqrt{8} =$
 $20\sqrt{48} = 20\sqrt{16}\sqrt{3} =$
 $20(4)\sqrt{3} = 80\sqrt{3}$
8. $\frac{5\sqrt{6}}{\sqrt{7}} - \frac{\sqrt{5}}{\sqrt{6}} = \frac{5\sqrt{6}\sqrt{7}}{\sqrt{7}\sqrt{7}} - \frac{\sqrt{5}\sqrt{6}}{\sqrt{6}\sqrt{6}} =$
 $\frac{5\sqrt{42}}{\sqrt{49}} - \frac{\sqrt{30}}{\sqrt{36}} = \frac{5\sqrt{42}}{7} - \frac{\sqrt{30}}{6} =$
 $\frac{5\sqrt{42}(6)}{7(6)} - \frac{\sqrt{30}(7)}{6(7)} =$
 $\frac{30\sqrt{42}}{42} - \frac{7\sqrt{30}}{42} = \frac{30\sqrt{42} - 7\sqrt{30}}{42}$
9. check with ruler and protractor
10. $360^\circ - (2 \times 123^\circ) =$
 $360^\circ - 246^\circ = 114^\circ$
 $114^\circ \div 2 = 57^\circ$
11. Figure is a parallelogram
 $A = bh = (6)(3.5) = 21 \text{ cm}^2$
12. $(N-2)180^\circ \Rightarrow ((5)-2)180^\circ =$
 $(3)(180^\circ) = 540^\circ \text{ total}$
 $540^\circ \div 5 \text{ sides} = 108^\circ \text{ per side}$
13. $A = \pi r^2 \approx (3.14)(62^2)$
 $= 12,070.16 \text{ mm}^2$
14. $C = 2\pi r \approx (2)(3.14)(62)$
 $= 389.36 \text{ mm}$
15. $V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(1^3) \approx 4.19 \text{ m}^3$
16. $\frac{120^\circ}{360^\circ} = \frac{1}{3}$
17. circle:
 $A = \pi r^2 \approx (3.14)(3^2) = 28.26 \text{ units}^2$
 sector: $A = \frac{1}{3}(28.26) = 9.42 \text{ units}^2$

18. $A = \frac{1}{2}bh = \frac{1}{2}(8)(4\sqrt{7}) = 16\sqrt{7} \text{ in}^2$
 5 triangles
19. $5(16\sqrt{7}) = 80\sqrt{7} \text{ in}^2$
20. $P = 5(8) = 40 \text{ in}$

Systematic Review 20D

1. $7\sqrt{2}\sqrt{2} = 7\sqrt{4} = 7(2) = 14$
2. $7\sqrt{2}$
3. $\frac{25}{\sqrt{2}} = \frac{25\sqrt{2}}{\sqrt{2}\sqrt{2}} = \frac{25\sqrt{2}}{\sqrt{4}} = \frac{25\sqrt{2}}{2}$
4. $\frac{25\sqrt{2}}{2}$
5. $H^2 = 6^2 + 8^2$
 $H^2 = 36 + 64$
 $H^2 = 100$
 $H = 10$
6. $(12\sqrt{3})(4\sqrt{18}) = (12)(4)\sqrt{3}\sqrt{18} =$
 $48\sqrt{54} = 48\sqrt{9}\sqrt{6} = 48(3)\sqrt{6} =$
 $144\sqrt{6}$
7. $(4\sqrt{5})(20\sqrt{2}) = (4)(20)\sqrt{5}\sqrt{2} =$
 $80\sqrt{10}$
8. $\frac{2\sqrt{25}}{\sqrt{5}} + \frac{\sqrt{5}}{\sqrt{25}} = \frac{2(5)}{\sqrt{5}} + \frac{1}{\sqrt{5}} =$
 $\frac{10}{\sqrt{5}} + \frac{1}{\sqrt{5}} = \frac{11}{\sqrt{5}} =$
 $\frac{11\sqrt{5}}{\sqrt{5}\sqrt{5}} = \frac{11\sqrt{5}}{\sqrt{25}} = \frac{11\sqrt{5}}{5}$
9. Check with ruler and protractor:
 second pair of sides should
 be $\frac{7}{8}$ in. Angles should be 90° .
10. $P = 2(1\frac{3}{4} + \frac{7}{8}) = 2(\frac{7}{4} + \frac{7}{8}) =$
 $2(\frac{14}{8} + \frac{7}{8}) = 2(\frac{21}{8}) =$
 $\frac{42}{8} = \frac{21}{4} = 5\frac{1}{4} \text{ in}$
11. $V = \frac{4}{3}\pi r^3$

12. $(N-2)180^\circ \quad ((8)-2)180^\circ =$
 $(6)180^\circ = 1,080^\circ$ total;
 $1,080^\circ \div 8 = 135^\circ$ per angle
13. $V = \frac{1}{3}Bh = \frac{1}{3}\pi r^2 h \approx$
 $\frac{1}{3}(3.14)(8.3)^2(12.4) = 894.1 \text{ cm}^3$
14. diameter
15. $V = Bh = \pi r^2 h \approx$
 $(3.14)(8^2)(12) = 2,411.52 \text{ cm}^3$
16. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(8^2) + (2)(3.14)(8)(12) =$
 $401.92 + 602.88 = 1,004.8 \text{ cm}^2$
17. $\frac{60^\circ}{360^\circ} = \frac{1}{6}$
18. circle:
 $A = \pi r^2 \approx (3.14)(4^2) = 50.24 \text{ cm}^2$
 sector: $A = \frac{1}{6}(50.24) \approx 8.37 \text{ cm}^2$
19. semicircle:
 $A = \frac{1}{2}\pi r^2 \approx \frac{1}{2}(3.14)(3^2) = 14.13 \text{ in}^2$
 rectangle:
 $A = bh = (9)(6) = 54 \text{ in}^2$
 total:
 $A = 14.13 + 54 = 68.13 \text{ in}^2$
20. perimeter of semicircle is half the
 circumference of the circle:
 $P = \frac{1}{2}(2\pi r) \approx \frac{1}{2}(2)(3.14)(3) = 9.42 \text{ in}$
 rectangle (exterior lines only):
 $P = 9 + 6 + 9 = 24 \text{ in}$
 total: $9.42 + 24 = 33.42 \text{ in}$

Systematic Review 20E

1. $14\sqrt{3}\sqrt{2} = 14\sqrt{6}$
2. $14\sqrt{3}$
3. $\frac{5\sqrt{2}}{\sqrt{2}} = \frac{5}{1} = 5$
4. 5

5. $H^2 = 4^2 + 10^2$
 $H^2 = 16 + 100$
 $H^2 = 116$
 $H = \sqrt{116} = \sqrt{4 \cdot 29} = 2\sqrt{29}$
6. $(10\sqrt{2})(3\sqrt{8}) = (10)(3)\sqrt{2}\sqrt{8} =$
 $30\sqrt{16} = 30(4) = 120$
7. $(4\sqrt{7})(6\sqrt{3}) = (4)(6)\sqrt{7}\sqrt{3} = 24\sqrt{21}$
8. $\frac{2\sqrt{16}}{\sqrt{2}} + \frac{\sqrt{2}}{\sqrt{16}} = \frac{2(4)}{\sqrt{2}} + \frac{\sqrt{2}}{4} =$
 $\frac{8}{\sqrt{2}} + \frac{\sqrt{2}}{4} = \frac{8\sqrt{2}}{\sqrt{2}\sqrt{2}} + \frac{\sqrt{2}}{4} =$
 $\frac{8\sqrt{2}}{\sqrt{4}} + \frac{\sqrt{2}}{4} = \frac{8\sqrt{2}}{2} + \frac{\sqrt{2}}{4} =$
 $\frac{8\sqrt{2}(2)}{2(2)} + \frac{\sqrt{2}}{4} = \frac{16\sqrt{2}}{4} + \frac{\sqrt{2}}{4} = \frac{17\sqrt{2}}{4}$
9. Use your compass to draw a
 circle. Draw the radius, and use
 your protractor to measure out
 an angle of 210° . See the end
 of lesson 4 in the instruction
 manual for hints on drawing
 or measuring obtuse angles.
10. prism
11. $A = \frac{10+12}{2} (13)$
 $= (11)(13) = 143 \text{ units}^2$
12. $(N-2)180^\circ \quad ((10)-2)180^\circ =$
 $(8)180^\circ = 1,440^\circ$ total;
 $1,440^\circ \div 10 = 144^\circ$ per side
13. line or segment or ray
14. angles are congruent
15. $C = 2\pi r \approx (2)(3.14)(6) = 37.68 \text{ in}$
16. Measure of minor arc BC =
 $m\angle BOC = 90^\circ$
 $\frac{90^\circ}{360^\circ} = \frac{1}{4}$ so arc is $\frac{1}{4}$ of circle
 length of arc = $\frac{1}{4}(37.68) = 9.42 \text{ in}$
17. $37.68 - 9.42 = 28.26 \text{ in}$
18. $7x^2 + 28x + 28 =$
 $(7)(x^2 + 4x + 4) =$
 $(7)(x+2)(x+2)$

19. $3x^2 + 15x - 18 =$
 $(3)(x^2 + 5x - 6) =$
 $(3)(x+6)(x-1)$
20. $2x^2 + 11x + 5 =$

Lesson Practice 21A

- 60; 90
- scalene
- 2
- $\sqrt{3}$
- Pythagorean
- 2; multiply; $\sqrt{3}$
- $5\sqrt{3}$
- $5(2) = 10$
- $\frac{6\sqrt{3}}{\sqrt{3}} = \frac{6}{1} = 6$
- $6(2) = 12$
- $\frac{10\sqrt{3}}{2} = \frac{5\sqrt{3}}{1} = 5\sqrt{3}$
- $5\sqrt{3}\sqrt{3} = 5\sqrt{9} = 5(3) = 15$
- $8\sqrt{3}$
- $8(2) = 16$
- Because of the relationship between the lengths of the sides, we know that $\triangle DBC$ is a $30^\circ-60^\circ-90^\circ$ triangle, so the measures are 30° and 60° respectively.

Lesson Practice 21B

- false
- false
- true
- false
- true
- true
- $\frac{7\sqrt{3}}{\sqrt{3}} = \frac{7}{1} = 7$

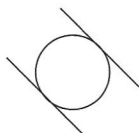
- $7(2) = 14$
- $\frac{8\sqrt{3}}{2} = \frac{4\sqrt{3}}{1} = 4\sqrt{3}$
- $4\sqrt{3}\sqrt{3} = 4\sqrt{9} = 4(3) = 12$
- $11(2) = 22$
- $11\sqrt{3}$
- $\frac{12\sqrt{3}}{\sqrt{3}} = \frac{12}{1} = 12$
- $12(2) = 24$
- radius of circle =
hypotenuse of triangle =
 $5(2) = 10$ cm

Systematic Review 21C

- $7(2) = 14$
- $7\sqrt{3}$
- $\frac{9\sqrt{3}}{\sqrt{3}}(2) = \frac{9}{1}(2) = 9(2) = 18$
- $\frac{9\sqrt{3}}{\sqrt{3}} = \frac{9}{1} = 9$
- $2\sqrt{2}\sqrt{2} = 2\sqrt{4} = 2(2) = 4$
- $2\sqrt{2}$
- $6\sqrt{2}$
- 6
- $(10\sqrt{20})(2\sqrt{7}) = (10)(2)\sqrt{20}\sqrt{7} =$
 $20\sqrt{140} = 20\sqrt{4}\sqrt{35} =$
 $20(2)\sqrt{35} = 40\sqrt{35}$
- $3\sqrt{5} + 4\sqrt{5} = (3+4)\sqrt{5} = 7\sqrt{5}$
- $\frac{4\sqrt{8}}{\sqrt{4}} + \frac{\sqrt{5}}{\sqrt{16}} = \frac{4\sqrt{8}}{2} + \frac{\sqrt{5}}{4} =$
 $\frac{4\sqrt{8}(2)}{2(2)} + \frac{\sqrt{5}}{4} = \frac{8\sqrt{8}}{4} + \frac{\sqrt{5}}{4} =$
 $\frac{8\sqrt{8} + \sqrt{5}}{4} = \frac{8\sqrt{4}\sqrt{2} + \sqrt{5}}{4} =$
 $\frac{8(2)\sqrt{2} + \sqrt{5}}{4} = \frac{16\sqrt{2} + \sqrt{5}}{4}$

$$\begin{aligned}
 12. \quad H^2 &= 22^2 + 16^2 \\
 H^2 &= 484 + 256 \\
 H^2 &= 740 \\
 H &= \sqrt{740} = \sqrt{4 \cdot 185} = 2\sqrt{185}
 \end{aligned}$$

$$\begin{aligned}
 13. \quad SA &= 4\pi r^2 \approx (4)(3.14)(1.5^2) = \\
 &28.26 \text{ in}^2
 \end{aligned}$$



$$\begin{aligned}
 14. \quad &\text{see drawing} \\
 15. \quad &\text{exterior angle} = 180^\circ - 140^\circ = 40^\circ \\
 &360^\circ \div 40^\circ = 9 \text{ sides}
 \end{aligned}$$

$$16. \quad C = 2\pi r \approx (2)(3.14)(7) = 43.96 \text{ in}$$

$$17. \quad \frac{180^\circ}{360^\circ} = \frac{1}{2}$$

$$18. \quad \frac{1}{2}(43.96) = 21.98 \text{ in}$$

19. area of semicircle is half area of circle:

$$\begin{aligned}
 A &= \frac{1}{2}\pi r^2 \approx \frac{1}{2}(3.14)(2.5^2) \\
 &\approx 9.81 \text{ cm}^2
 \end{aligned}$$

top base of trapezoid is twice the radius:

$$A = \frac{5+8}{2}(3) = 19.5 \text{ cm}^2$$

total:

$$9.81 + 19.5 = 29.31 \text{ cm}^2$$

20. semicircle:

$$\begin{aligned}
 C &= \frac{1}{2}(2\pi r) \approx \frac{1}{2}(2)(3.14)(2.5) \\
 &= 7.85 \text{ cm}
 \end{aligned}$$

trapezoid:

$$P = 4.5 + 8 + 4 = 16.5 \text{ cm}$$

total:

$$7.85 + 16.5 = 24.35 \text{ cm}$$

Systematic Review 21D

$$1. \quad \frac{4\sqrt{2}}{\sqrt{3}} = \frac{4\sqrt{2}\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{4\sqrt{6}}{\sqrt{9}} = \frac{4\sqrt{6}}{3}$$

$$2. \quad \frac{4\sqrt{6}}{3}(2) = \frac{8\sqrt{6}}{3}$$

$$3. \quad \frac{12\sqrt{3}}{2} = \frac{6\sqrt{3}}{1} = 6\sqrt{3}$$

$$4. \quad \frac{6\sqrt{3}}{\sqrt{3}} = \frac{6}{1} = 6$$

$$5. \quad 15\sqrt{2}$$

$$6. \quad 15$$

$$7. \quad 5\sqrt{2}\sqrt{2} = 5\sqrt{4} = 5(2) = 10$$

$$8. \quad 5\sqrt{2}$$

$$\begin{aligned}
 9. \quad (4\sqrt{4})(2\sqrt{4}) &= (4)(2)\sqrt{4}\sqrt{4} = \\
 8\sqrt{16} &= 8(4) = 32
 \end{aligned}$$

$$\begin{aligned}
 10. \quad 2\sqrt{18} + 5\sqrt{9} &= 2\sqrt{9}\sqrt{2} + 5(3) = \\
 2(3)\sqrt{2} + 15 &= 6\sqrt{2} + 15
 \end{aligned}$$

$$\begin{aligned}
 11. \quad \frac{3\sqrt{6}}{\sqrt{7}} + \frac{4\sqrt{6}}{\sqrt{5}} &= \frac{3\sqrt{6}\sqrt{7}}{\sqrt{7}\sqrt{7}} + \frac{4\sqrt{6}\sqrt{5}}{\sqrt{5}\sqrt{5}} = \\
 \frac{3\sqrt{42}}{\sqrt{49}} + \frac{4\sqrt{30}}{\sqrt{25}} &= \frac{3\sqrt{42}}{7} + \frac{4\sqrt{30}}{5} = \\
 \frac{3\sqrt{42}(5)}{7(5)} + \frac{4\sqrt{30}(7)}{5(7)} &= \\
 \frac{15\sqrt{42}}{35} + \frac{28\sqrt{30}}{35} &= \\
 \frac{15\sqrt{42} + 28\sqrt{30}}{35}
 \end{aligned}$$

$$12. \quad 13^2 + L^2 = 17^2$$

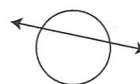
$$169 + L^2 = 289$$

$$L^2 = 120$$

$$L = \sqrt{120} = \sqrt{4}\sqrt{30} = 2\sqrt{30}$$

$$\begin{aligned}
 13. \quad SA &= 4\pi r^2 \approx (4)(3.14)(2)^2 \\
 &= 50.24 \text{ in}^2
 \end{aligned}$$

14. see drawing



$$\begin{aligned}
 15. \quad \text{exterior angle} &= 180^\circ - 150^\circ = 30^\circ \\
 360^\circ \div 30^\circ &= 12 \text{ sides}
 \end{aligned}$$

$$16. \quad C = 2\pi r \approx (2)(3.14)(4) = 25.12 \text{ in}$$

$$17. \quad \frac{270^\circ}{360^\circ} = \frac{3}{4}$$

$$18. \frac{3}{4}(25.12) = (.75)(25.12) = 18.84 \text{ in}$$

$$19. V = \text{Area of base times height} = \frac{1}{2}(6.2)(9.1)(13) = 366.73 \text{ in}^3$$

20. triangles:

$$A = (2)\frac{1}{2}bh = (2)\frac{1}{2}(6.2)(9.1) = 56.42 \text{ in}^2$$

large rectangles:

$$A = (2)(11)(13) = 286 \text{ in}^2$$

small rectangle:

$$A = (6.2)(13) = 80.6 \text{ in}^2$$

total:

$$A = 56.42 + 286 + 80.6 = 423.02 \text{ in}^2$$

$$13. A = \frac{1}{2}bh = \frac{1}{2}(11)(1\sqrt{3}) = 60.5\sqrt{3} \text{ units}^2$$

14. one triangle:

$$A = \frac{1}{2}bh = \frac{1}{2}(5\sqrt{11})(14) = 35\sqrt{11} \text{ in}^2$$

six triangles:

$$A = (6)(35\sqrt{11}) = 210\sqrt{11} \text{ in}^2$$

$$15. V = Bh = \pi r^2 h \approx (3.14)(6^2)(4) = 452.16 \text{ ft}^3$$

$$16. (62)(452.16) = 28,033.92 \text{ lbs}$$

$$17. 28,033.92 + 2,000 \approx 14.02 \text{ tons}$$

$$18. 45^\circ - 45^\circ - 90^\circ \text{ triangle: } 2Y\sqrt{2}$$

19. using Pythagorean theorem:

$$A^2 + (3A)^2 = H^2$$

$$A^2 + (3A)(3A) = H^2$$

$$A^2 + 9A^2 = H^2$$

$$10A^2 = H^2$$

$$\sqrt{10A^2} = H = \sqrt{A^2}\sqrt{10} = A\sqrt{10}$$

$$20. L^2 + B^2 = (B\sqrt{10})^2$$

$$L^2 + B^2 = (B\sqrt{10})(B\sqrt{10})$$

$$L^2 + B^2 = B^2\sqrt{100}$$

$$L^2 + B^2 = 10B^2$$

$$L^2 = 9B^2$$

$$L = \sqrt{9B^2} = \sqrt{9}\sqrt{B^2} = 3B$$

Systematic Review 21E

$$1. \frac{\sqrt{3}}{\sqrt{3}} = 1$$

$$2. 1(2) = 2$$

$$3. \frac{16\sqrt{7}\sqrt{3}}{2} = \frac{16\sqrt{21}}{2} = \frac{8\sqrt{21}}{1} = 8\sqrt{21}$$

$$4. \frac{16\sqrt{7}}{2} = \frac{8\sqrt{7}}{1} = 8\sqrt{7}$$

$$5. 8\sqrt{2}$$

$$6. 8$$

$$7. 7\sqrt{2}\sqrt{2} = 7\sqrt{4} = 7(2) = 14$$

$$8. 7\sqrt{2}$$

$$9. (3\sqrt{10})(7\sqrt{10}) = (3)(7)\sqrt{10}\sqrt{10} = 21\sqrt{100} = 21(10) = 210$$

$$10. 5\sqrt{7} + 4\sqrt{3} = 5\sqrt{7} + 4\sqrt{3}: \text{cannot be simplified}$$

$$11. \frac{10\sqrt{18}}{2\sqrt{6}} = \frac{10\sqrt{3}}{2} = \frac{5\sqrt{3}}{1} = 5\sqrt{3}$$

$$12. 11^2 + L^2 = 22^2$$

$$121 + L^2 = 484$$

$$L^2 = 363$$

$$L = \sqrt{363} = \sqrt{121}\sqrt{3} = 11\sqrt{3} \text{ units}$$

Lesson Practice 22A

1. axiom; postulate

2. theorems

3. converses

4. congruent

5. bisector

6. congruent

7. congruent

8. 180°

9. parallel

10. 360°