

Systematic Review 15E

1. $V = Bh = \frac{1}{2}(4.5)(4.2)(11)$
 $= 103.95 \text{ mm}^3$
2. $V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(1.5^3)$
 $= 14.13 \text{ cm}^3$
3. pyramid:
 $V = \frac{1}{3}Bh = \frac{1}{3}(8)(8)(6) = 128 \text{ ft}^3$
 rectangular solid:
 $V = (8)(8)(3) = 192 \text{ ft}^3$
 total:
 $V = 128 + 192 = 320 \text{ ft}^3$
4. altitude
5. prism
6. $\frac{1}{3}$
7. $A = bh = (8)(3.5) = 28 \text{ in}^2$
8. $P = 8 + 4 + 8 + 4 = 24 \text{ in}$
9. $A = \frac{1}{2}(8) \times \frac{1}{2}(10) \times \pi \approx (4)(5)(3.14)$
 $= 62.8 \text{ ft}^2$
10. equilateral
11. $(N-2)180^\circ \Rightarrow ((5)-2)180^\circ =$
 $(3)180^\circ = 540^\circ$
 $540^\circ \div 5 = 108^\circ$
12. 8
13. exterior angles =
 $180^\circ - 135^\circ = 45^\circ$;
 $360^\circ \div 45^\circ = 8 \text{ sides}$
14. check with ruler
15. check with protractor:
 angles should measure 55°
16. check with protractor
17. $8^3 \cdot 8^4 = 8^{3+4} = 8^7$
18. $2^8 \div 2^3 = 2^{8-3} = 2^5$
19. $X^2X^3Y^5Y^{-1} = X^{2+3}Y^{5+(-1)} = X^5Y^4$
20. $\frac{1}{10^3} = \frac{10^{-3}}{1} = 10^{-3}$

Lesson Practice 16A

1. 6
2. 5
3. 4
4. circles; rectangle
5. square
6. height; circumference
7. $SA = 2(3)(5) + 2(3)(4) + 2(4)(5) =$
 $30 + 24 + 40 = 94 \text{ ft}^2$
8. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(10^2) + (2)(3.14)(10)(5) =$
 $628 + 314 = 942 \text{ ft}^2$
9. $SA = (5)(5) + (4) \frac{1}{2}(5)(6) =$
 $25 + 60 = 85 \text{ in}^2$
10. base:
 $SA = \frac{1}{2}(6)(5) = 15 \text{ ft}^2$
 sides:
 $SA = (3) \frac{1}{2}(6)(8) = 72 \text{ ft}^2$
 total:
 $SA = 15 + 72 = 87 \text{ ft}^2$
11. $SA = 2(5)(4) + 2(5)(7) + 2(4)(7) =$
 $40 + 70 + 56 = 166 \text{ ft}^2$
12. "roof":
 $SA = 2(4.5)(6) = 54 \text{ ft}^2$
 sides:
 $SA = 2(4)(5) + 2(4)(6)$
 $= 40 + 48 = 88 \text{ ft}^2$
 triangles:
 $SA = 2 \frac{1}{2}(4)(5) = 20 \text{ ft}^2$
 bottom:
 $SA = (5)(6) = 30 \text{ ft}^2$
 total:
 $SA = 54 + 88 + 20 + 30 = 192 \text{ ft}^2$

Lesson Practice 16B

1. square
2. pyramid
3. cube

4. triangular
5. cylinder
6. rectangular
7. $SA =$
 $2(10)(30) + 2(10)(20) + 2(20)(30) =$
 $600 + 400 + 1,200 = 2,200 \text{ ft}^2$
8. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(15^2) + (2)(3.14)(15)(60) =$
 $1,413 + 5,652 = 7,065 \text{ in}^2$
9. $SA = (3.6)(3.6) + (4)(\frac{1}{2})(3.6)(5.2) =$
 $12.96 + 37.44 = 50.4 \text{ ft}^2$
10. $SA =$
 $(2)(\frac{1}{2})(4.8)(3.2) + (2)(4)(7.8) + (4.8)(7.8) =$
 $15.36 + 62.4 + 37.44 = 115.2 \text{ cm}^2$
11. $SA =$
 $(2)(\frac{1}{2})(8)(9) + (11)(15) + (8)(15) + (9)(15) =$
 $72 + 165 + 120 + 135 = 492 \text{ in}^2$
12. "roof":
 $SA = (2)(6)(6) = 72 \text{ ft}^2$
 triangles:
 $SA = (2)(\frac{1}{2})(5)(4) = 20 \text{ ft}^2$
 sides:
 $SA = (2)(5)(5) + (2)(6)(5) = 50 + 60 = 110 \text{ ft}^2$
 bottom:
 $SA = (5)(6) = 30 \text{ ft}^2$
 total:
 $SA = 72 + 20 + 110 + 30 = 232 \text{ ft}^2$

Systematic Review 16C

1. $SA = (2)(2) + (4)(\frac{1}{2})(2)(4) = 4 + 16$
 $= 20 \text{ m}^2$
2. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(5^2) + (2)(3.14)(5)(12) =$
 $157 + 376.8 = 533.8 \text{ cm}^2$

3. "roof":
 $SA = (2)(9)(12) = 216 \text{ m}^2$
 triangles:
 $SA = (2)(\frac{1}{2})(9)(8) = 72 \text{ m}^2$
 sides:
 $SA = (2)(6)(12) + (2)(6)(9)$
 $= 144 + 108 = 252 \text{ m}^2$
 bottom:
 $SA = (9)(12) = 108 \text{ m}^2$
 total:
 $SA = 216 + 72 + 252 + 108 = 648 \text{ m}^2$
4. slant height
5. $V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(1.66^3)$
 $\approx 19.15 \text{ in}^3$
6. latitude
7. straight angle
8. $C = 2\pi r \approx (2)(3.14)(7) = 43.96 \text{ ft}$
9. $V = Bh = \pi r^2 h \approx (3.14)(5^2)(12)$
 $= 942 \text{ cm}^3$
10. secant
11. $(N-2)180^\circ \Rightarrow ((12)-2)180^\circ =$
 $(10)180^\circ = 1,800^\circ$
 $1,800^\circ \div 12 = 150^\circ$
12. exterior angle $= 180^\circ - 108^\circ = 72^\circ$
 $360^\circ \div 72^\circ = 5 \text{ sides}$
13. check with protractor
14. check with protractor
15. check with ruler and protractor:
 all angles should measure 90°
16. rays $\overrightarrow{EF}$, $\overrightarrow{FE}$, $\overrightarrow{FB}$, $\overrightarrow{BF}$, $\overrightarrow{EB}$, or $\overrightarrow{BE}$
17. $\overline{AF}$, $\overline{FD}$, and $\overline{AD}$
18. $m\angle BFC = \frac{1}{2}(m\angle BFD) =$
 $\frac{1}{2}(90^\circ) = 45^\circ$
 definition of a bisector
 $m\angle AFC = m\angle AFB + m\angle BFC =$
 $90^\circ + 45^\circ = 135^\circ$

19. $\perp$, or is perpendicular to
 20. congruent; If alternate interior angles are congruent, they are formed by parallel lines cut by a transversal.

Systematic Review 16D

1. $SA =$
 $(2)(\frac{1}{2})(9)(4.2) + (2)(6.2)(11) + (9)(11) =$
 $37.8 + 136.4 + 99 = 273.2 \text{ mm}^2$
2. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(8^2) + (2)(3.14)(8)(10) =$
 $401.92 + 502.4 = 904.32 \text{ cm}^2$
3. triangles:
 $SA = (4)(\frac{1}{2})(6)(5.2) = 62.4 \text{ ft}^2$
 sides:
 $SA = (4)(6)(2.7) = 64.8 \text{ ft}^2$
 bottom:
 $SA = (6)(6) = 36 \text{ ft}^2$
 total:
 $62.4 + 64.8 + 36 = 163.2 \text{ ft}^2$
4. altitude
5. $V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(1.5^3)$
 $= 14.13 \text{ in}^3$
6. $V = \frac{1}{3}Bh = \frac{1}{3}\pi r^2 h \approx$
 $\frac{1}{3}(3.14)(2.8^2)(4.7) \approx 38.57 \text{ cm}^3$
7. reflex angle
8. 4
9. $A = \frac{1}{2}(10) \times \frac{1}{2}(20) \times \pi \approx$
 $(5)(10)(3.14) = 157 \text{ in}^2$
10. sector
11. $(N-2)180^\circ \Rightarrow ((5)-2)180^\circ =$
 $(3)180^\circ = 540^\circ$

12. $(N-2)(180^\circ) = 360^\circ$
 $180N^\circ - 360^\circ = 360^\circ$
 $180N^\circ = 720^\circ$
 $N = \frac{720^\circ}{180^\circ} = 4 \text{ sides}$
13. check with ruler
14. check with protractor:
 Fourth angle is 60° .
15. Interior angles of a quadrilateral add up to 360° , so fourth angle has a measure of:
 $360^\circ - (65^\circ + 115^\circ + 120^\circ) =$
 $360^\circ - 300^\circ = 60^\circ$
16. 90° , because $\vec{AD} \perp \vec{EC}$
17. complementary
18. supplementary; they form a straight line
19. $m\angle BGC =$
 $m\angle EGC - (m\angle EGF + m\angle FAB) =$
 $180^\circ - (34^\circ + 90^\circ) =$
 $180^\circ - 124^\circ = 56^\circ$
20. perpendicular; If 90° angles are formed from intersecting lines, the lines are perpendicular.

Systematic Review 16E

1. $SA =$
 $(2)(5)(15) + (2)(5)(25) + (2)(15)(25) =$
 $150 + 250 + 750 = 1,150 \text{ in}^2$
2. $SA = 2\pi r^2 + 2\pi rh \approx$
 $(2)(3.14)(4^2) + (10)(3.14)(8) =$
 $100.48 + 251.2 = 351.68 \text{ cm}^2$

4. triangular
5. cylinder
6. rectangular
7. $SA =$
 $2(10)(30) + 2(10)(20) + 2(20)(30) =$
 $600 + 400 + 1,200 = 2,200 \text{ ft}^2$
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 bottom:
 $SA = (5)(6) = 30 \text{ ft}^2$
 total:
 $SA = 72 + 20 + 110 + 30 = 232 \text{ ft}^2$

Systematic Review 16C

1. $SA = (2)(2) + (4)(\frac{1}{2})(2)(4) = 4 + 16$
 $= 20 \text{ m}^2$
2. $SA = 2\pi r^2 + 2\pi rh \approx$
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 $m\angle AFC = m\angle AFB + m\angle BFC =$
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3. "roof":

$$SA = (4)\left(\frac{1}{2}\right)(8)(9) = 144 \text{ ft}^2$$

sides:

$$SA = (4)(8)(3) = 96 \text{ ft}^2$$

bottom:

$$SA = (8)(8) = 64 \text{ ft}^2$$

total:

$$144 + 96 + 64 = 304 \text{ ft}^2$$

4. c

5. d

6. a

7. e

8. h

9. b

10. j

11. f

12. i

13. g

14. measure of minor arc AB =
 $m\angle AOB = 40^\circ$

15. measure of minor arc ABC =
 $m\angle AOB + m\angle BOC =$
 $40^\circ + 100^\circ = 140^\circ$

16. measure of arc ABCD =
 $m\angle AOB + m\angle BOC + m\angle COD =$
 $40^\circ + 100^\circ + 40^\circ = 180^\circ$

$$\begin{array}{r} 17. \quad X + 4 \\ \times X + 8 \\ \hline 8X + 32 \end{array}$$

$$\begin{array}{r} X^2 + 4X \\ \hline X^2 + 12X + 32 \end{array}$$

$$\begin{array}{r} 18. \quad X + 5 \\ \times X + 2 \\ \hline 2X + 10 \end{array}$$

$$X^2 + 7X + 10$$

$$\begin{array}{r} 19. \quad X + 3 \\ \times X - 1 \\ \hline -X - 3 \end{array}$$

$$\begin{array}{r} X^2 + 3X \\ \hline X^2 + 2X - 3 \end{array}$$

$$\begin{array}{r} 20. \quad X - 4 \\ \times X + 6 \\ \hline 6X - 24 \end{array}$$

Lesson Practice 17A

1. $5\sqrt{2} + 3\sqrt{5} = 5\sqrt{2} + 3\sqrt{5}$:
 cannot be simplified

2. $8\sqrt{7} + 7\sqrt{7} = 15\sqrt{7}$

3. $12\sqrt{6} - 10\sqrt{6} = (12 - 10)\sqrt{6} = 2\sqrt{6}$

4. $11\sqrt{2} + 3\sqrt{2} + 5\sqrt{2} =$
 $(11 + 3 + 5)\sqrt{2} = 19\sqrt{2}$

5. $\frac{12\sqrt{24}}{6\sqrt{3}} = \frac{12\sqrt{8}}{6} = 2\sqrt{8} =$
 $2\sqrt{4}\sqrt{2} = 2(2)\sqrt{2} = 4\sqrt{2}$

6. $\frac{25\sqrt{10}}{5\sqrt{5}} = \frac{25\sqrt{2}}{5} = 5\sqrt{2}$

7. $\sqrt{24} = \sqrt{4}\sqrt{6} = 2\sqrt{6}$

8. $\sqrt{300} = \sqrt{100}\sqrt{3} = 10\sqrt{3}$

9. $\sqrt{48} = \sqrt{16}\sqrt{3} = 4\sqrt{3}$

10. $(5\sqrt{3})(6\sqrt{5}) = (5)(6)\sqrt{3}\sqrt{5} = 30\sqrt{15}$

11. $(6\sqrt{6})(7\sqrt{2}) = (6)(7)\sqrt{6}\sqrt{2} =$
 $42\sqrt{12} = 42\sqrt{4}\sqrt{3} =$

$$42(2)\sqrt{3} = 84\sqrt{3}$$

12. $(2\sqrt{3})(2\sqrt{3}) = (2)(2)\sqrt{3}\sqrt{3} =$

$$4\sqrt{9} = 4(3) = 12$$

13. $\sqrt{5} \approx 2.24$

14. $\sqrt{3} \approx 1.73$

15. $\sqrt{14} \approx 3.74$

16. radical

17. numbers; radicals

18. square