Geometry Cumulative Review Keys

Chapter 1

Cumulative Review

1. *Sample answers:* Line k; $\overleftrightarrow{BC}$ **2.** A, B, C

3. *Sample answer:* plane BCD **4.** $\overrightarrow{CA}$

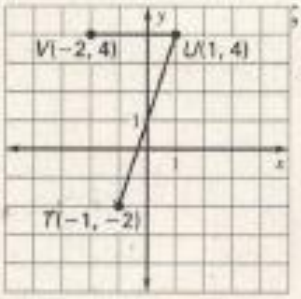
5. $\overrightarrow{BC}$ and $\overrightarrow{BA}$; $\overrightarrow{FB}$ and $\overrightarrow{FE}$

6. *Sample answer:* ℓ **7.** B **8.** $\overline{PQ} \ncong \overline{RS}$

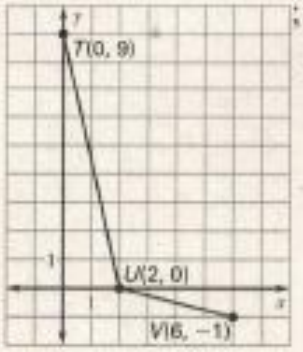
9. $\overline{FE} \cong \overline{GH}$ **10.** $GM = 11$ **11.** $TV = \frac{166}{11}$

12. $(2, 3)$ **13.** $(-14, -5)$ **14.** $m\angle ABD = 107°$

15. $m\angle MKL = 33°$

16. 

; $\angle TUV$ is acute;
Sample point: $(-2, 0)$

17. 

; $\angle TUV$ is obtuse;
Sample point: $(2, 1)$

18. $m\angle 2 = 55°$ **19.** $m\angle 2 = 74°$

20. $m\angle 2 = 10°$ **21.** $m\angle 2 = 36°$

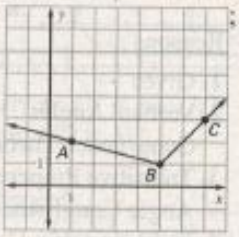
22. convex polygon **23.** concave polygon

24. not a polygon **25.** $x = 8$ **26.** $x = 17.5$

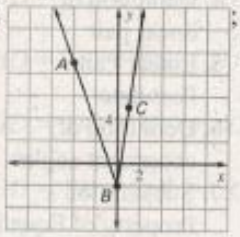
27. $x = 15$ **28.** 150,000 cm^2 **29.** $5\frac{5}{9}$ yd^2

30. $5\frac{1}{8}$ ft^2 **31.** 47.1 in. **32.** 176.7 $in.^2$

33. Yes; 180 $in.^2$

7. 

; $\angle ABC$ is obtuse; *Sample point:* (0, 3)

8. 

; $\angle ABC$ is acute; *Sample point:* (0, 0)

9. $m\angle 2 = 155°$ **10.** $m\angle 2 = 144°$

11. $m\angle 2 = 72°$ **12.** $m\angle 2 = 126°$

13. $x = 5$ cm **14.** $x = 16$ mm **15.** $x = 5$ in.

16. $3\frac{1}{9}$ yd^2 **17.** $h = 17$ cm **18.** $\ell = 17$ in.

19. *Sample answer:* 9

20. *Sample answer:* -10 and 2

21. *Sample answer:* 15° and 43°

22. Converse: If a polygon is a parallelogram, then it is a rectangle. (false); Inverse: If a polygon is not a rectangle, then it is not a parallelogram. (false); Contrapositive: If a polygon is not a parallelogram, then it is not a rectangle. (true)

23. Converse: If a number is rational, then the number is an integer. (false); Inverse: If a number is not an integer, then it is not rational. (false); Contrapositive: If a number is not rational, then the number is not an integer. (true) **24.** If a triangle has a 90° angle, then the two acute angles are complementary. **25.** If you like to study history, then you enjoy going to the library.

26. If you pass a driver's test, then you must act responsibly. **27.** True **28.** False, select two points along the intersection of a wall and the floor. **29.** True **30.** False, the intersection of the ceiling and a wall is a line.

31. $y = \frac{20 - 7x}{-2}$; reasons will vary

32. $y = 10.5$; reasons will vary

33. $h = \frac{V}{\ell w}$; Division Property of Equality

34. $h = 11$ in.

35. Symmetric Property of Equality of Angle Measures **36.** Reflexive Property of Equality of Segment Lengths **37.** $m\angle K = 180° - 9x°$

Cumulative Review

1. 7 **2.** 7 **3.** 4 **4.** 13

5. $BC = 2\sqrt{17}$; $EF = 8\sqrt{2}$; $\overline{BC} \ncong \overline{EF}$

6. $MN = \sqrt{137}$; $OP = \sqrt{130}$; $\overline{MN} \ncong \overline{OP}$

Cumulative Review

1. $x = 8$; $DE = 37$; $EF = 29$ **2.** $x = 9$; $DE = 7$; $EF = 12$ **3.** $x = 12$; $DE = 4$; $EF = 36$

4. $CD = 10\frac{3}{4}$ in. **5.** $m\angle DEG = 28°$; $m\angle GEF = 152°$ **6.** $m\angle DEG = 110°$; $m\angle GEF = 70°$ **7.** Convex polygon **8.** not a polygon **9.** concave polygon **10.** 408 m^2

11. 82 m **12.** perfect squares; 36 **13.** times ten, cut in half, repeat; 1000 **14.** false; a right triangle

15. false; a trapezoid **16.** Reflexive Property of Equality **17.** Symmetric Property of Equality

18. Transitive Property of Equality

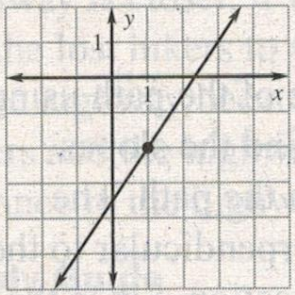
19. Transitive Property of Equality

20. Perpendicular **21.** Perpendicular

22. Parallel **23.** $x = 104$; $y = 76$

24. $x = 15°$; $y = 75°$ **25.** $x = 7$ **26.** $x = 95$

27.



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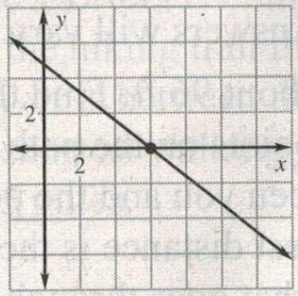

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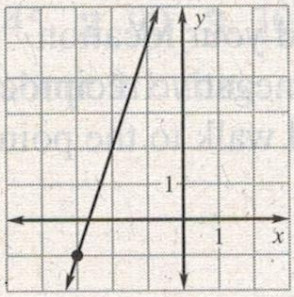
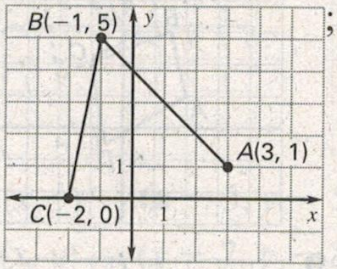


30. $y = \frac{3}{2}x - \frac{7}{2}$ **31.** $y = -\frac{24}{5}x + \frac{24}{5}$

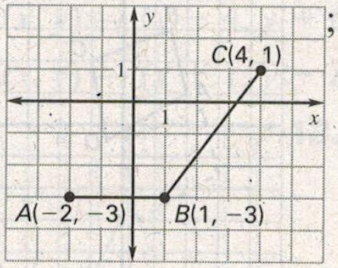
32. $y = 3x + 8$

Cumulative Review

1. 2.4 cm **2.** 3.1 cm **3.** $(-1, 3)$

4. 

; $\angle ABC$ is acute; *Sample answer:* (0, 1)

5. 

; $\angle ABC$ is obtuse; *Sample answer:* (2, 0)

6. a. 452.16 ft^2 **b.** 75.36 ft **7.** Add 6 to previous number; 21 **8.** Multiply previous number by 10; 70,000 **9.** Subtract 9 from previous number; −15 **10.** If an angle is a right angle, then the angle measures 90°. **11.** If you are a football player, then you are an athlete.

12. If you are a high school student, then you must take three math courses.

13. $w = \frac{P - 2\ell}{2}$; $w = 5.5$ ft **14.** 140°; 40°

15. alternate interior **16.** alternate exterior

17. consecutive interior **18.** corresponding

19. alternate interior **20.** alternate exterior

21. neither **22.** parallel **23.** $E = 25x + 320$

24. \$395 **25.** $x = 25.5$; obtuse triangle

26. $x = 45$; right triangle **27.** corresponding angles **28.** neither **29.** corresponding sides

30. AAS; $\triangle DCA \cong \triangle BAC$

Cumulative Review

1. $\overrightarrow{AB}$ **2.** $\overrightarrow{EA}, \overrightarrow{EB}, \overrightarrow{EC}, \overrightarrow{ED}$ **3.** $\overline{CB}$ **4.** $\overrightarrow{CE}$

5. $m\angle A = 109°; m\angle B = 71°$

6. $m\angle A = 49°; m\angle B = 41°$

7. $m\angle A = 229°; m\angle B = 131°$

8. Trisha is at school. **9.** $\angle X \cong \angle Y$

10. Taylor is a U.S. citizen.

11. Alternate Exterior Angles Theorem

12. Corresponding Angles Postulate

13. Alternate Interior Angles Theorem

14. Consecutive Interior Angles Theorem

15. $x = 25$ **16.** $x = 17$

17. $\triangle ABD \cong \triangle CBD$; AAS Congruence Theorem

18. $\triangle FIH \cong \triangle JIG$; HL Congruence Theorem

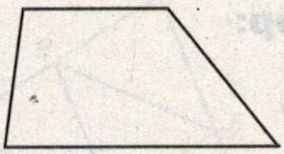
19. $x = y = 41$ **20.** $x = 94; y = 16$

21. $x = 39; y = 19$ **22.** $(9, -2)$ **23.** $(6, -4)$

24. 22 **25.** 7 **26.** $AC = 11$ **27.** $BC = 6$

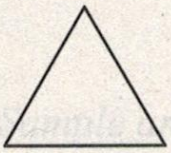
Cumulative Review

1. *Sample answer:*



2. *Sample answer:*

3. *Sample answer:*



4. $x = 29; y = 63$ **5.** $x = 3; y = 12$

6. Yes; Alternate Exterior Angles Converse

7. No **8.** Yes; Corresponding Angles Converse

9. $\triangle ABD \cong \triangle CDB$; Alternate interior angle congruence and reflexive property of congruence of segments provide missing information.

10. $\triangle BEC \cong \triangle DEA$; Vertical angle congruence and alternate interior congruence of angles provide missing information.

11.

Statements	Reasons
1. $\angle B \cong \angle E$	**1.** Definition of regular polygon.
2. $AE \cong AB, ED \cong BC$	**2.** Definition of regular polygon.
3. $\triangle ABC \cong \triangle AED$	**3.** SAS Congruence Theorem

12. $x = 6$ **13.** $x = 15$ **14.** $x = 14$

15. The third side must be greater than 3 meters and less than 21 meters. **16.** The third side must be greater than 8 yards and less than 42 yards.

17. The third side must be greater than 14 inches and less than 86 inches.

18. The arithmetic mean is higher. **19.** true

20. true **21.** $\frac{5}{17}$ **22.** $x = 20.4; z = 9$

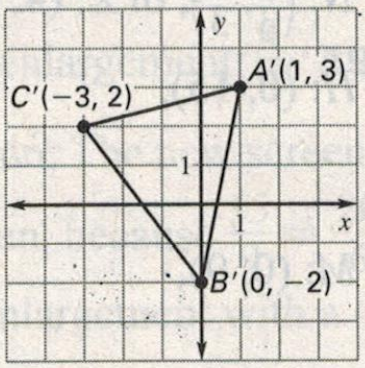
23. $\triangle ABC$ perimeter $= 26$;
$\triangle DEF$ perimeter $= 88.4$

24. $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF} = \frac{2}{5}$; scale factor $= \frac{2}{5}$

25. $\frac{AB}{DE} = \frac{AC}{DF} = \frac{BC}{EF} = \frac{4}{3}$; scale factor $= \frac{4}{3}$

26. scale factor $= 13$

27.



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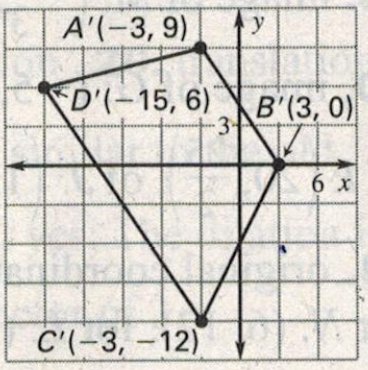
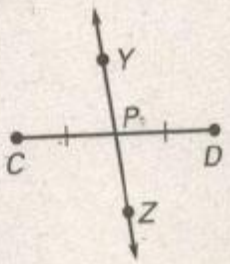


Cumulative Review

1.



No, the line can bisect the segment by intersecting it at any angle.

2. 98°; 82° **3.** About 3.2 units

4. About 4.5 units **5.** No **6.** Yes; AAS

7. Yes; ASA **8.** No **9.** $QR = 12$

10. $PQ = \frac{58}{3}$ **11.** $AB = 14$ **12.** $x = 2$

13. $x = 9$ **14.** $x = 5$ **15.** 120 feet; 56 feet

16. Not similar **17.** $\triangle DEF \sim \triangle IHG$

18. $y = 24$ **19.** $s = 8.75$ **20.** 12 feet

21. Yes; right triangle **22.** Not a triangle

23. Yes; obtuse triangle

24. $\triangle JKL \sim \triangle JMK \sim \triangle KML$

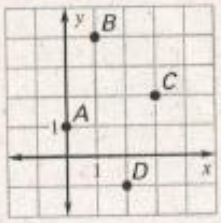
25. $\triangle TUV \sim \triangle WUT \sim \triangle WTV$

26. $m\angle A \approx 49.6°$ **27.** $m\angle A \approx 54.8°$

Chapter 8

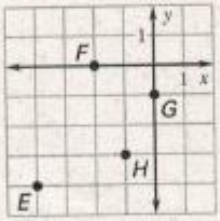
Cumulative Review

1.



congruent

2.



not congruent

3. $5x + 35 = 1$ **4.** $\frac{1}{3}CD$ **5.** $m\angle J = m\angle F$

6. $m = -\frac{1}{7}$ **7.** $m = \frac{4}{13}$ **8.** $m = 0$

9. $y = -\frac{3}{2}x + 9$ **10.** $y = \frac{1}{5}x + \frac{39}{5}$

11. $(x, y) \rightarrow (x - 5, y + 1)$

12. $(x, y) \rightarrow (x + 7, y - 2)$ **13.** $AB = 21$

14. $AB = 19$ **15.** yes **16.** No; $10 + 11 < 22$

17. yes **18.** The first jogger is farther from the pavilion; Hinge Theorem **19.** 12°, 42°, 126°

20. 36°, 45°, 99° **21.** 48°, 64°, 68°

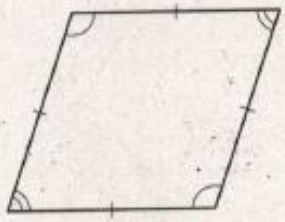
22. $TZ = 8.25$ **23.** $E(15.4, 0)$ **24.** $E(-17.5, 0)$

25. $c = 7\sqrt{2}$ **26.** $a = 16\sqrt{3}$; $k = 32$

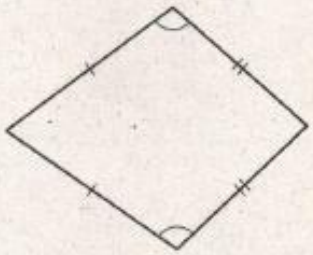
27. 148.6 ft^2 **28.** $MN = 21$ **29.** $MN = 32.5$

30. $MN = 13.1$

31. *Sample answer:*



32. *Sample answer:*



Cumulative Review

1. $m\angle R = (95 - 3x)^\circ$ **2.** $y = \frac{2}{3}x - \frac{25}{3}$

3. $y = -5x - 13$ **4.** $x = 28$; obtuse triangle

5. $x = 29$; acute triangle **6.** $x = 7$ **7.** $x = 17$

8. Assume temporarily that the whole number is *not* even. **9.** Assume temporarily that $\triangle ABC$ is *not* an isosceles triangle. **10.** $d = 17.6$

11. $k = 1.5$ **12.** $x = 4$

13. $\triangle ABC \sim \triangle RST$ because $\frac{AB}{RS} = \frac{BC}{ST} = \frac{AC}{RT}$.

14. $z = 76.8$ **15.** $y = 45$ **16.** $x = 40$

17. about 77 ft **18.** 24 **19.** 6 **20.** $D(2, 4)$

21. $D(-4, -1)$ **22.** 40° **23.** 90° **24.** 20

25. about 8.3 **26.** 50° **27.** 13

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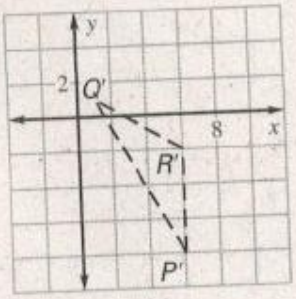

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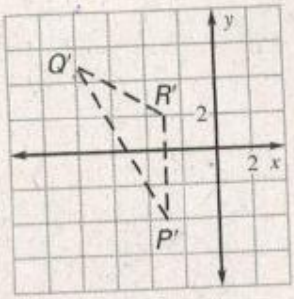

30. $\begin{bmatrix} 1 & -3 \\ 12 & 7 \end{bmatrix}$ **31.** $\begin{bmatrix} 11 & 8 & -8 \\ 1 & 17 & -1 \end{bmatrix}$

32. $\begin{bmatrix} -23 & -17 \\ -36 & -18 \end{bmatrix}$ **33.** $\begin{bmatrix} -13 \\ 25 \end{bmatrix}$

Chapter 10

13. $\triangle ABC \sim \triangle RST$ because $\frac{AB}{RS} = \frac{BC}{ST} = \frac{AC}{RT}$.

14. $z = 76.8$ **15.** $y = 45$ **16.** $x = 40$

17. about 77 ft **18.** 24 **19.** 6 **20.** $D(2, 4)$

21. $D(-4, -1)$ **22.** 40° **23.** 90° **24.** 20

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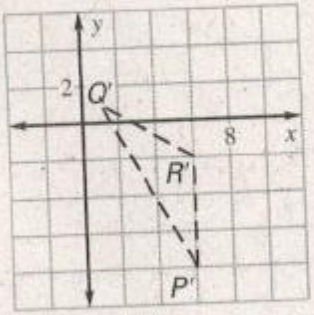

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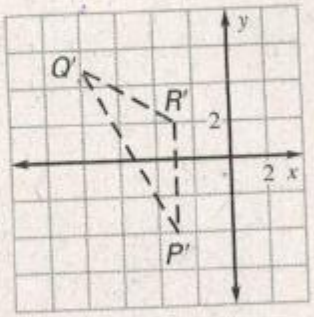
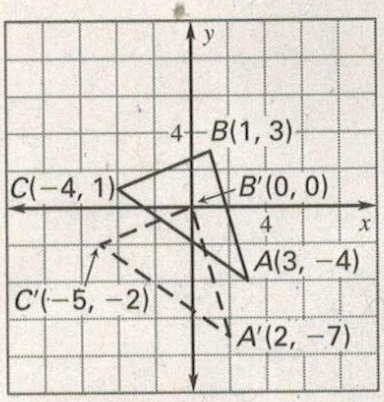


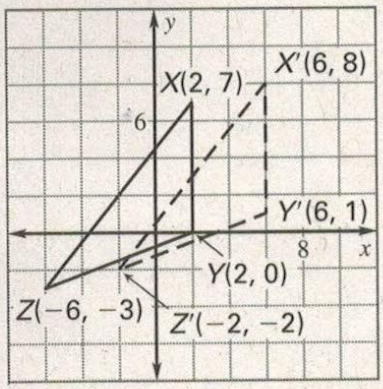
30. $\begin{bmatrix} 1 & -3 \\ 12 & 7 \end{bmatrix}$ **31.** $\begin{bmatrix} 11 & 8 & -8 \\ 1 & 17 & -1 \end{bmatrix}$

32. $\begin{bmatrix} -23 & -17 \\ -36 & -18 \end{bmatrix}$ **33.** $\begin{bmatrix} -13 \\ 25 \end{bmatrix}$

13. $\begin{matrix} A' & B' & C' \end{matrix}$
$\begin{bmatrix} 2 & 0 & -5 \\ -7 & 0 & -2 \end{bmatrix}$

14. $\begin{matrix} X' & Y' & Z' \end{matrix}$
$\begin{bmatrix} 6 & 6 & -2 \\ 8 & 1 & -2 \end{bmatrix}$





15. $\begin{matrix} A & B & C & D \end{matrix}$
$\begin{bmatrix} -2 & -1 & 4 & 0 \\ 1 & 5 & 3 & -3 \end{bmatrix}$;
$\begin{matrix} A' & B' & C' & D' \end{matrix}$
$\begin{bmatrix} 2 & 1 & -4 & 0 \\ 1 & 5 & 3 & -3 \end{bmatrix}$

16. $\begin{matrix} D & E & F \end{matrix}$
$\begin{bmatrix} -7 & -1 & 4 \\ -2 & 1 & 0 \end{bmatrix}$;
$\begin{matrix} D' & E' & F' \end{matrix}$
$\begin{bmatrix} -7 & -1 & 4 \\ 2 & -1 & 0 \end{bmatrix}$

17. $\begin{bmatrix} 6 & -4 & -2 & -18 \\ -10 & 2 & -14 & -12 \end{bmatrix}$

18. $\begin{bmatrix} 0 & -5 \\ 45 & 10 \end{bmatrix}$ **19.** $\begin{bmatrix} 4 & -2 \\ 0 & 3 \\ -8 & 10 \end{bmatrix}$

20. 3.5; yes **21.** $r = 25.5$ **22.** $x = \pm 5$

23. $x = 76; y = 105$ **24.** $k = 62; n = 124$

25. $m = 43.5; n = 21$ **26.** $x = 73$ **27.** $x = 22$

Chapter 11

Cumulative Review

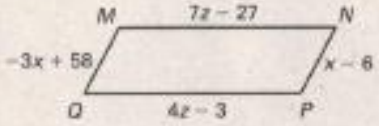
1. 176.7 m^2 **2.** 47.1 m **3.** *Sample answer:* $\frac{24}{3} = 8$

4. *Sample answer:* $1, 2, \sqrt{5}$ **5.** $m\angle M = 36°$, $m\angle P = 36°$, $m\angle N = 108°$ **6.** Not a right triangle

7. right triangle; altitude ≈ 5.1

8. right triangle; altitude ≈ 3.7

9. Perimeter = 78 units



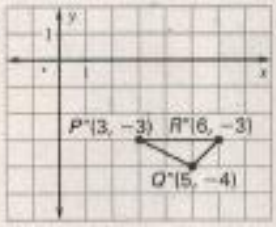
10. $x = 4$ **11.** $x = 2$ **12.** $x = 11$

13.
$$\begin{matrix} & A' & B' & C' \\ & -3 & 4 & 1 \\ & 2 & -1 & -5 \end{matrix}$$

14.
$$\begin{matrix} & D' & E' & F' \\ & -1 & -5 & -2 \\ & -4 & 0 & 3 \end{matrix}$$

15.
$$\begin{matrix} & W' & X' & Y' & Z' \\ & 3 & 2 & -1 & -4 \\ & 4 & 0 & 1 & 5 \end{matrix}$$

16.



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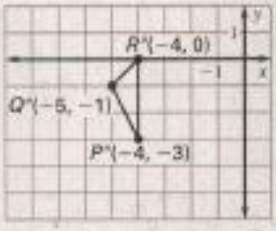
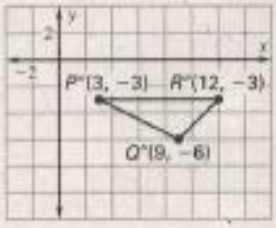


18.



19. No; radii are different. **20.** Yes; both arcs have congruent central angles and congruent radii.

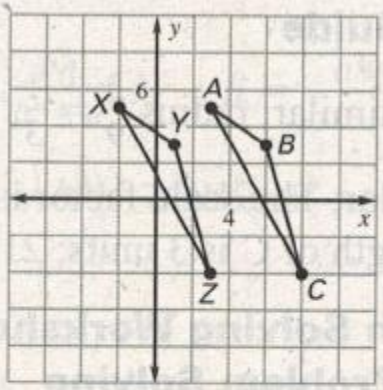
21. $x = 4$ **22.** $x = 20.75$ **23.** $x \approx 10.16$

24. 84 **25.** 95 **26.** 119 **27.** 12π

Cumulative Review

1. $x = 12; y = 33$ **2.** $x = 25; y = 58$

3. *Sample answer:*



4. $x = 27.6$ **5.** $x = 47.0$ **6.** $x = 5.3$ **7.** 1980°

8. 1080° **9.** 3600° **10.** 540° **11.** Kite; $\overline{PQ} \cong \overline{PS}$ and $\overline{QR} \approx \overline{SR}$ are pairs of consecutive sides **12.** Trapezoid; $\overline{PQ} \parallel \overline{SR}$ and $\overline{PS}$ is not $\parallel$ to $\overline{QR}$ **13.** Parallelogram; $\overline{QR} \parallel \overline{PS}$ and $\overline{RS} \parallel \overline{QP}$

14. Rhombus; $\overline{PQ} \parallel \overline{RS}$, $\overline{PS} \parallel \overline{QR}$, and $\overline{QS} \perp \overline{PR}$

15. Translate down 5 and left 2, then reflect over the y-axis. **16.** Rotate 90° counterclockwise about the origin, then translate down 6 units.

17. 2 **18.** 1 **19.** 8

20. $(x + 3)^2 + (y - 2)^2 = 64$

21. $(x - 6)^2 + (y + 1)^2 = 98$ **22.** 5 : 3

23. 13 : 15 **24.** $\sqrt{3} : 2$ **25.** 120.6 ft^2; 683.6 ft^2

26. 236.0 cm^2; 295.0 cm^2

27. $S = 226.73$ cm^2; $V = 209.44$ cm^3

28. $S = 142$ ft^2; $V = 105$ ft^3

29. $S = 389.56$ m^2; $V = 458.90$ m^3

30. $S = 345.70$ $in.^2$; $V = 378$ $in.^3$

31. $S = 78.54$ ft^2; $V = 65.45$ ft^3

32. $S = 251.14$ $in.^2$; $V = 290.98$ $in.^3$