Answers

Chapter 1

1.1 Review & Refresh

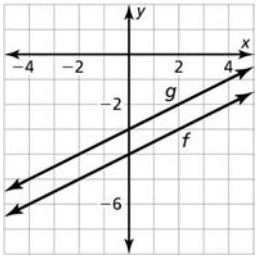
1. Lines a and c are parallel. They have the same slope.

2. $\overline{BE} \cong \overline{DE}$

3. $\overline{BE} \cong \overline{DE}$

4. 9

5.



The graph of g is a horizontal translation 2 units left of the graph of f.

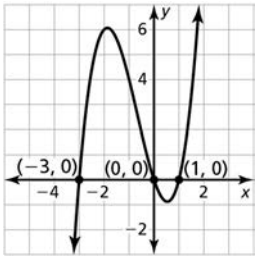
6. *Sample answer:* $\overleftrightarrow{AB}$, $\overleftrightarrow{GH}$

7. *Sample answer: A, B, C*

8. *Sample answer:* plane *AGD,* plane *BHF*

9. *Sample answer:* $\overline{DE}$, $\overline{BC}$

10.



11.

		Siblings		
		Yes	No	Total
Pets	Yes	6	7	13
	No	15	4	19
	Total	21	11	32

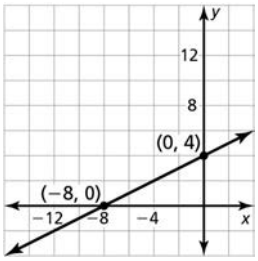
1.2 Review & Refresh

1. $y = 5$

2. $x = -4$

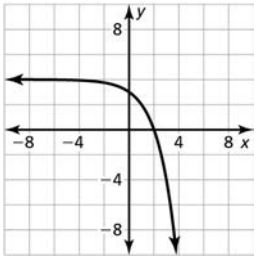
3. $-8 < x \leq -2$

4.



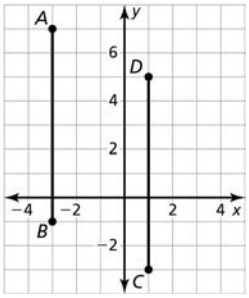
5. not a function; The input 5 is paired with two outputs, 6 and 8.

6.

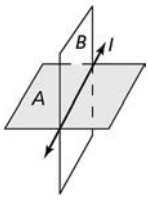


7. 7

8.



9.

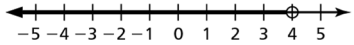


1.3 Review & Refresh

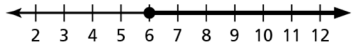
1. 12 in., 9 in.^{2}

2. 24 cm, 24 cm^2

3. $a < 4$



4. $z \geq 6$



5. n; 22

6. (1, 0); 10

7. $y = -6x + 2$

8. $7z(z - 3)$

9. $(9x + 5)(9x - 5)$

10. $\overrightarrow{TP}$ and $\overrightarrow{TQ}$, $\overrightarrow{TR}$ and $\overrightarrow{TS}$

Answers

11. d **12.** 40 favors **13.** $AC = 15$

1.4 Review & Refresh

1. linear; As x increases by 1, y increases by 3.

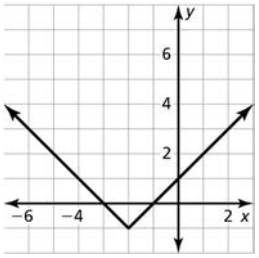
2. $x = 10$ **3.** $x = -7$

4. *Sample answer:* $\overline{DC}$

5. $(-3, 1)$, $2\sqrt{5}$, or about 4.5

6. $y = 100(1.0025)^{12t}$

7.



The graph of g is a translation 2 units left and 1 unit down of the graph of f.

10. 14 units **9.** 10 square units

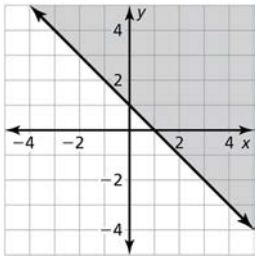
1.5 Review & Refresh

1. $12 + \sqrt{74}$, or about 20.6 units; 17.5 square units

2. $x = 5$ **3.** $3\sqrt{2}$

4. cord connecting Pillar B to Pillar C; about 23.8 m

5.



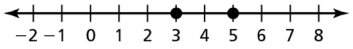
6. 150° **7.** 47°, 94° **8.** 32

1.6 Review & Refresh

1. 16 square units **2.** $(-3, 2)$

3. point E; 22

4. $z = 3$ and $z = 5$



5. $3x^2 + 5x - 2$

6. The graph of g is a horizontal shrink by a factor of $\frac{2}{3}$ of the graph of f.

7. 31°, 31° **8.** 48° **9.** 75°

Chapter 1 B.E.S.T. Test Prep

1. B, E **2.** B **3.** D **4.** 12.9

5. 5 **6.** B **7.** C **8.** A

9. B **10.** C

11. $f(x) = -\frac{2}{9}(x - 25)^2 + 200$

12. A **13.** C **14.** B, C **15.** A

16. A **17.** 65°; acute **18.** 69.8

19. 100 **20.** C **21.** D

Chapter 2

2.1 Review & Refresh

1. a. 5

b. 4.6

2. yes; Every input has exactly one output.

3. The graph of g is a vertical stretch by a factor of 2 of the graph of f.

4. 9°, 171°

5. $4 + 4\sqrt{2}$, or about 9.66 units; 4 square units

6. 1,876,000 **7.** 56°, 112°

8. $m^2 - 5m - 8$ **9.** $x \geq 4$

10. a. If you post a video, then your video goes viral.

b. If your video goes viral, then you post a video.

c. If you do not post a video, then your video does not go viral.

d. If your video does not go viral, then you did not post a video.

2.2 Review & Refresh

1. hypothesis: There is fracking; conclusion: Microearthquakes occur; If there is fracking, then microearthquakes will occur.

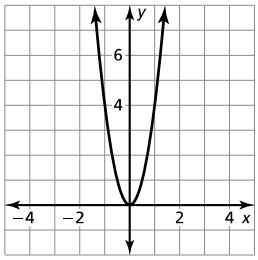
2. quadrilateral; concave

3. $a_1 = 25, a_n = a_{n-1} - 4$

Answers

4. $y = -x + 4$ **5.** nonlinear

6.



The graph of g is a vertical stretch by a factor of 4 of the graph of f.

7. $5p^2 - 4$ **8.** $x = 5$

9. 14, 17, 20 **10.** $x = 2$

11. Nothing can be concluded.

2.3 Review & Refresh

1. *Sample answer:* rectangle

2. $z = 1$; Subtraction Property of Equality, Simplify.

3. $y = -6$; Multiplication Property of Equality, Simplify.

4. 93° **5.** 4 in., 2 in.

6. a. Each term is equal to the product of the previous term and 3.

b. −27, −81, −243

7. Your phone vibrates if and only if you have an unread notification.

8. yes **9.** yes **10.** no

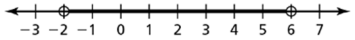
2.4 Review & Refresh

1. Segment Addition Postulate

2.

Equation	Explanation and Reason
$8x + 4y = 4$	Write the equation. Given
$2x + y = 1$	Divide each side by 4. Division Property of Equality
$2x + y - 2x = 1 - 2x$	Subtract $2x$ from each side. Subtraction Property of Equality
$y = 1 - 2x$	Combine like terms. Simplify.

3. $-2 < x < 6$



4. If the battery drops below 10%, then the smartphone displays a warning.

5. $x \geq 10$

$x \leq 15$

$y \geq 10x$

6. The square of an even integer is an even integer; Let n be an integer. Then $2n$ is an even integer because it is the product of 2 and an integer. $(2n)^2$ represents the square of an even integer. $2n \bullet 2n = 4n^2$, which is an even integer because it is the product of 2 and an integer $2n^2$.

7. The function is positive when $x < -2$ and $0 < x < 1$ and is negative when $-2 < x < 0$ and $x > 1$. The function is increasing when $-1.22 < x < 0.5$ and decreasing when $x < -1.22$ and $x > 0.5$. $y \to +\infty$ as $x \to -\infty$ and $y \to -\infty$ as $x \to +\infty$.

8. Addition Property of Equality; Subtraction Property of Equality; Division Property of Equality

2.5 Review & Refresh

1. $x = \pm 4$; Explanations will vary.

2. nonlinear **3.** 83°

4. The sum of an integer and its square is even; Let $2m + 1$ represent an odd integer. Then $(2m + 1) + (2m + 1)^2 = 2m + 1 + 4m^2 + 4m + 1 = 2(2m^2 + 3m + 1)$, which is even. Let $2n$ represent an even integer. Then $2n + 4n^2 = 2(n + 2n^2)$, which is even.

5.

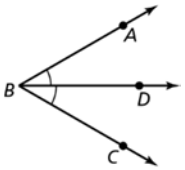
Equation	Explanation and Reason
$-2(3x + 5) = 3x + 17$	Write the equation. Given
$-6x - 10 = 3x + 17$	Multiply. Distributive Property
$-6x - 10 + 10 = 3x + 17 + 10$	Add 10 to each side. Addition Property of Equality
$-6x = 3x + 27$	Combine constant terms. Simplify.
$-6x - 3x = 3x + 27 - 3x$	Subtract 3x from each side. Subtraction Property of Equality
$-9x = 27$	Combine like terms. Simplify.
$x = -3$	Divide each side by −9. Division Property of Equality.

Answers

6. Reflexive Property of Equality

7. $60

8. *Sample answer:*



9. Segment Addition Postulate; Segment Addition Postulate

2.6 Review & Refresh

1. *Sample answer: B*, *C*, and *D*

2. Sample answer: Because *F*, *G*, and *H* are noncollinear, there is exactly one plane through points *F*, *G*, and *H*.

3. a. $a = \frac{v_f - v_i}{t}$

b. 1.25 meters per second squared

4. $x^2 - 12x + 36 = (x - 6)^2$

5. $m\angle 1 = 112°$; $m\angle 2 = 68°$; $m\angle 4 = 112°$

6.

STATEMENTS	REASONS
1. $\angle ABD$ is a straight angle. $\angle CBE$ is a straight angle.	**1.** Given
2. $\angle ABC$ and $\angle CBD$ are supplementary.	**2.** Definition of supplementary angles
3. $\angle DBE$ and $\angle CBD$ are supplementary.	**3.** Definition of supplementary angles
4. $\angle ABC \cong \angle DBE$	**4.** Congruent Supplements Theorem

Chapter 2 B.E.S.T. Test Prep

1. D **2.** D **3.** 99

4. 11.5 **5.** C **6.** D **7.** C, E

8. Addition Property of Equality

9. B **10.** D **11.** A

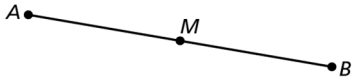
12. B, D, E **13.** A **14.** B

15. C **16.** A

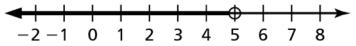
Chapter 3

3.1 Review & Refresh

1.



2. $x < 5$



3. Symmetric Property of Angle Congruence

4. alternate interior angles

5. (−8, −1) **6.** $\overline{WX} \cong \overline{QR}$

7.

STATEMENTS	REASONS
1. M is the midpoint of $\overline{AB}$. $\overline{CM} \cong \overline{MB}$	**1.** Given
2. $\overline{AM} \cong \overline{MB}$	**2.** Definition of midpoint
3. $\overline{MB} \cong \overline{CM}$	**3.** Symmetric Property of Segment Congruence
4. $\overline{AM} \cong \overline{CM}$	**4.** Transitive Property of Segment Congruence

8. $y = -3x + 10$ **9.** −3

10. 923.6 cubic meters

3.2 Review & Refresh

1. $\overleftrightarrow{GH}$ and $\overleftrightarrow{QR}$

2. no; Because consecutive interior angles are not supplementary, the lines are not parallel.

3. *Sample answer*: $m\angle 1 = 73°$ by Alternate Interior Angles Theorem; $m\angle 2 = 107°$ by Consecutive Interior Angles Theorem

4. Symmetric Property of Segment Congruence

5. Transitive Property of Angle Congruence

6. $16x^4(x + 2)(x - 2)$ **7.** $(y - 7)(y^2 + 5)$

8. (−3, 0), (0, 8) **9.** $6x - 3$; 33 in.^{2}

10. $x = 17$

3.3 Review & Refresh

1. 17 **2.** D **3.** $x = 21$

Answers

4. 263; The ball reaches a maximum height of 263 feet after 4 seconds.

5. $x = 24$; Lines k and ℓ are parallel when the marked alternate interior angles are congruent.

$$(5x - 72)^\circ = 2x^\circ$$
$$3x = 72$$
$$x = 24$$

6. $\overleftrightarrow{XS}$ and $\overleftrightarrow{QV}$

7. no; There is no information to prove the lines are parallel.

8. (−20, 18); Explanations will vary.

9. (2, 25); Explanations will vary.

10. $f(-3) = 38$; $f(2) = -2$; $f(6) = -34$

3.4 Review & Refresh

1. $m = -\frac{2}{3}$, $b = 1$

2. $m = -7$, $b = 16$

3. 86°

4. $m = -\frac{1}{2}$

5. a. 412 yd

b. 1326 yd

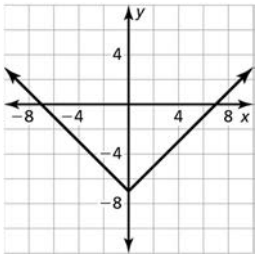
6. (−4, 3), (−1, −3)

7. $\overleftrightarrow{MJ}$

8. $\overleftrightarrow{MN}$

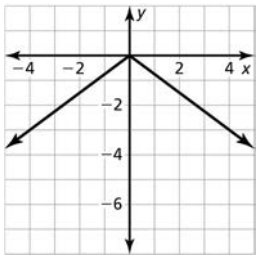
9. plane MNP

10.



The graph of g is a vertical translation 7 units down of the graph of f; domain: all real numbers, range: $y \geq -7$

11.



The graph of g is a vertical shrink by a factor of $\frac{3}{4}$ and a reflection in the x-axis of the graph of f; domain: all real numbers, range: $y \leq 0$

3.5 Review & Refresh

1. $x = 12$; Lines m and n are parallel when the marked alternate interior angles are congruent.

$$(11x + 4)^\circ = 136^\circ$$
$$11x = 132$$
$$x = 12$$

2. The product of three consecutive even numbers is even; *Sample answer:* $2 \bullet 4 \bullet 6 = 48$; $6 \bullet 8 \bullet 10 = 480$; $10 \bullet 12 \bullet 14 = 1680$

3. $7 + 2\sqrt{10} + \sqrt{61} \approx 21.13$ units

4. $x = -4$

5. $b \parallel c$; Because the marked angles are congruent, $b \parallel c$ by the Corresponding Angles Converse.

6. $(3x + 2)(2x + 1)$

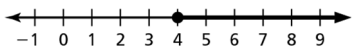
7. $y = -2x + 5$

8. $x \geq -\frac{3}{8}$

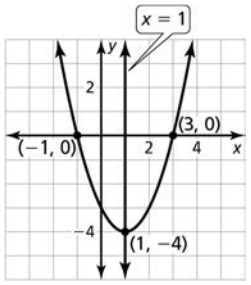
9. $x = -18, x = 0$

10. $m\angle 2 = 128^\circ$; The measures of consecutive interior angles are supplementary by the Consecutive Interior Angles Theorem.

11. $w \geq 4$



12.



domain: all real numbers; range: $y \geq -4$

Answers

Chapter 3 B.E.S.T. Test Prep

1. B **2.** D **3.** 3.25

4. 11 **5.** B **6.** C

7. D **8.** B **9.** A, C

10. C **11.** 56.5

12. (0.5, 2) **13.** C **14.** B, C, F

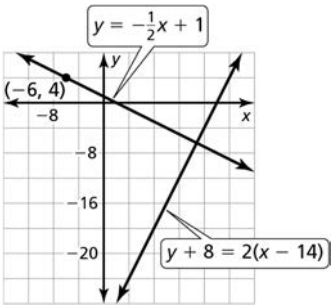
15. B **16.** D **17.** A

Chapter 4

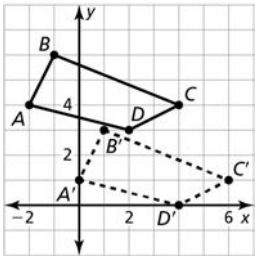
4.1 Review & Refresh

1. yes; Alternate Interior Angles Converse

2. $y = -\frac{1}{2}x + 1$



3.

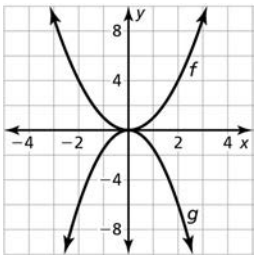


4. $a_n = 11 - 4n,\ a_{10} = -29$

5. $x = -5, x = 0, x = 5$

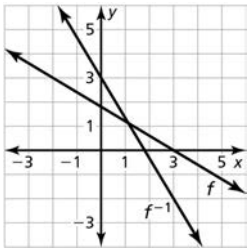
6. $\frac{4 - \sqrt{5}}{4}$, or about 0.441 seconds and $\frac{4 + \sqrt{5}}{4}$, or about 1.559 seconds

7.



The graph of g is a vertical stretch by a factor of 1.5 and a reflection in the x-axis of the graph of f.

8. $f^{-1}(x) = -\frac{5}{3}x + 3$



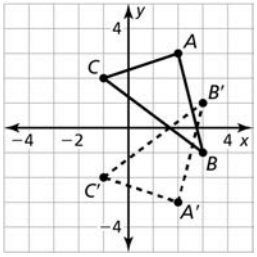
9. $A'(-5, 15)$ **10.** $B(1, -5)$

4.2 Review & Refresh

1. $2\sqrt{5}$, or about 4.5 units

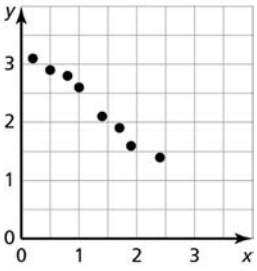
2. $x = -2, x = 1$ **3.** $x = 1$

4.



5. Symmetric Property of Angle Congruence

6.



The data show a negative correlation.

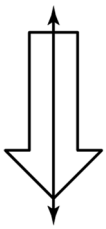
7. $\sqrt{5}$, or about 2.2 units **8.** $h(-2) = -17$

9. $A'(2, 4)$ **10.** $-(2t - 3)(2t - 5)$

Answers

11. $x^2 + 2x - 80$

12.



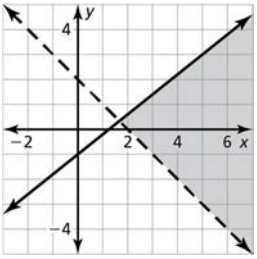
4.3 Review & Refresh

1. $m\angle EDF = 61°$, $m\angle CDE = 122°$

2. $\angle C$ and $\angle K$, $\angle D$ and $\angle L$, $\angle E$ and $\angle M$, $\angle F$ and $\angle N$; $\overline{CD}$ and $\overline{KL}$, $\overline{DE}$ and $\overline{LM}$, $\overline{EF}$ and $\overline{MN}$, $\overline{FC}$ and $\overline{NK}$

3. $P(4, 7)$

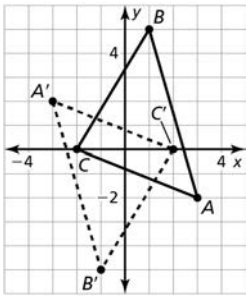
4.



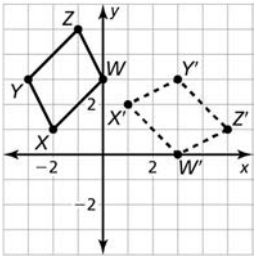
Sample answer: (4, 1)

5. linear; As x increases by 1, y increases by 4.

6.



7.



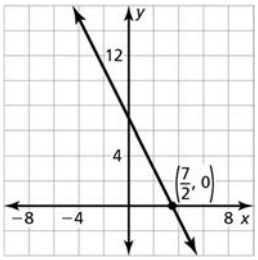
8. The leftmost tie is parallel to the rightmost tie by the Transitive Property of Parallel Lines.

4.4 Review & Refresh

1. $x = -3$ **2.** $n = 3$ **3.** 37.5%

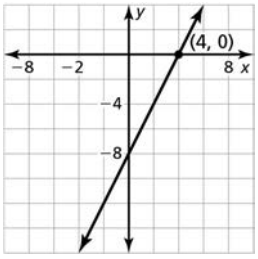
4. *Sample answer:* translation 1 unit right and 1 unit down followed by a reflection in the x-axis

5.



x-intercept: $\frac{7}{2}$

6.



x-intercept: 4

7. $x < \frac{7}{2}$

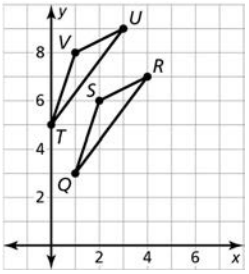
8. conditional statement: If you bake cookies, then you turn the oven on; true
converse: If you turn the oven on, then you bake cookies; false
inverse: If you do not bake cookies, then you do not turn the oven on; false
contrapositive: If you do not turn the oven on, then you do not bake cookies; true

9. 7; $8x° = 56°$
$x = 7$

10. 11.5; $(4x + 26)° + 108° = 180°$
$4x + 134 = 180$
$4x = 46$
$x = 11.5$

Answers

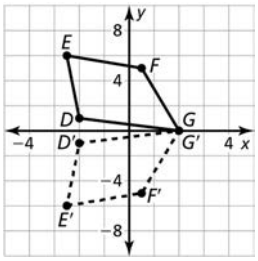
11.



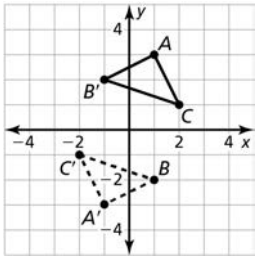
yes; $\triangle TUV$ is a translation 1 unit to the left and 2 units up of $\triangle QRS$.

4.5 Review & Refresh

1.



2.

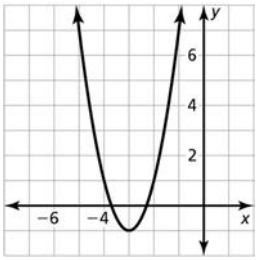


3. $\frac{3}{x^3}$

4. 315 in.^{2}

5. *Sample answer:* rotation of 90° about the origin, followed by a reflection in the y-axis

6.



The graph of g is a translation 3 units left, followed by a vertical stretch by a factor of 2, then a translation 1 unit down of the graph of f.

7. $16x^2 - 56x + 49$

8. $-5y^2 - 7y + 24$

9. $(2, -1)$

10. $F'\left(0, -\frac{4}{3}\right), G'\left(-\frac{7}{3}, -4\right), H'\left(1, -\frac{2}{3}\right)$

4.6 Review & Refresh

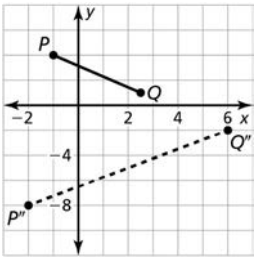
1. right

2. acute

3. obtuse

4. straight

5.



6. $y = \frac{3}{2}x + 9$

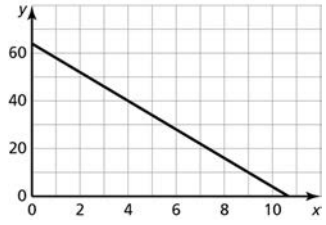
7.

Equation	Explanation and Reason
$7x + 15 = 3x - 9$	Write the equation. Given
$4x + 15 = -9$	Subtract $3x$ from each side. Subtraction Property of Equality
$4x = -24$	Subtract 15 from each side. Subtraction Property of Equality
$x = -6$	Divide each side by 4. Division Property of Equality

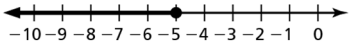
8. yes; DEF is a reflection in the x-axis of ABC followed by a dilation of 2.

9. a. $0 \le g \le 10\frac{2}{3}$; continuous; You can pour any portion of a glass.

b.

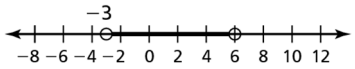


10. $x \le -5$



Answers

11. $-3 < a < 6$



Chapter 4 B.E.S.T. Test Prep

1. B, C, E **2.** 22

3. C **4.** C **5.** A

6. −10 **7.** 13.45

8. B **9.** C **10.** C

11. B **12.** 7.6

13. $(x, y) \rightarrow (x + 6, y - 1)$

14. A **15.** D **16.** B

17. B **18.** A, C, D

Chapter 5

5.1 Review & Refresh

1. yes; $\triangle GHI$ is a translation 1 unit left and 4 units down of $\triangle DEF$.

2. 18°, 72°

3. $y = \frac{3}{2}, y = 4$ **4.** $t = 2$

5. $k = \frac{7}{4}$; enlargement **6.** 106°

7. 155° **8.** scalene; right

9. *Sample answer:* is a dilation with a scale factor of, followed by a translation 3 units right and 1 unit down of

10. $\overleftrightarrow{HB} \parallel \overleftrightarrow{FD}$ **11.** $\overleftrightarrow{AE} \perp \overleftrightarrow{GC}$

5.2 Review & Refresh

1. *Sample answer:* $\triangle ABC \cong \triangle DFE$;
Corresponding angles: $\angle A \cong \angle D, \angle B \cong \angle F, \angle C \cong \angle E$;
Corresponding sides: $\overline{AB} \cong \overline{DF}, \overline{BC} \cong \overline{FE}, \overline{AC} \cong \overline{DE}$

2. $k = \frac{5}{2}$ **3.** $(x - 5)(x + 3)$

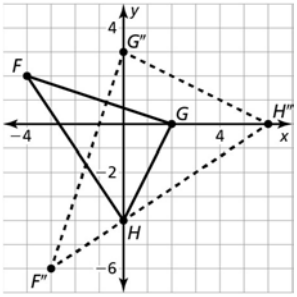
4. $(5x - 3)(x + 4)$ **5.** $x = 25, y = 2$

6. $x = 6, y = 10$

7. From the diagram, $\overline{KL} \cong \overline{GH}$, $\overline{LM} \cong \overline{HI}$, $\overline{MN} \cong \overline{IJ}$, and $\overline{NK} \cong \overline{JG}$. Also from the diagram, $\angle K \cong \angle G, \angle L \cong \angle H, \angle M \cong \angle I$, and $\angle N \cong \angle J$. Because all corresponding parts are congruent, $KLMN \cong GHIJ$.

8. 33° **9.** 139°

10.



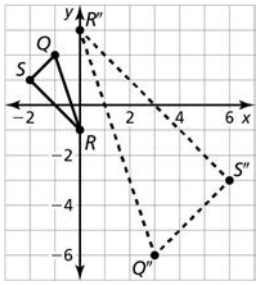
11. The graph of g is a horizontal shrink by a factor of a reflection in the x-axis, and a vertical translation 3 units up of the graph of f.

12. The graph of g is a vertical shrink by a factor of and a vertical translation 1 unit down of the graph of f.

5.3 Review & Refresh

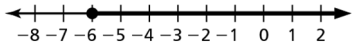
1. obtuse scalene **2.** right isosceles

3.

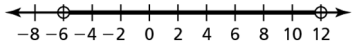


4. yes; Because $\overleftrightarrow{PQ} \parallel \overleftrightarrow{ST}$, $\angle PQR \cong \angle STR$ by the Alternate Interior Angles Theorem. It is given that $\overline{PQ} \cong \overline{ST}$, and $\overline{QR} \cong \overline{TR}$. So, $\triangle PQR \cong \triangle STR$ by the SAS Congruence Theorem.

5. $x \geq -6$



6. $-6 < d < 12$



Answers

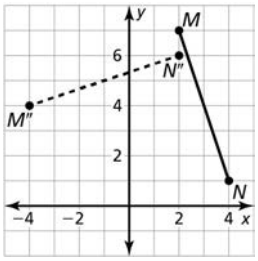
7. $x = 3, y = 8$

8. no; The sample size is not large enough to make a valid conclusion about the population.

5.4 Review & Refresh

1. $\angle H, \angle E$ **2.** $\angle I, \angle T$ **3.** 39°

4.



5. $m\angle F = 84°$; $GH = 6$ m

6. $3\sqrt{10}$, or about 9.5 units

7. mean: 24, median: 23, mode: none, range: 16

8. $x = 7, y = -4$ **9.** $x = 50, y = 75$

10. $x = 70, y = 20$

5.5 Review & Refresh

1. no; $m\angle VYZ = 37°$ and $m\angle YVW = 153°$ because vertical angles are congruent. Because $m\angle VYZ + m\angle YVW = 37° + 153° = 190°$, the consecutive interior angles are not supplementary. So, $\overleftrightarrow{UW}$ and $\overleftrightarrow{XZ}$ are not parallel.

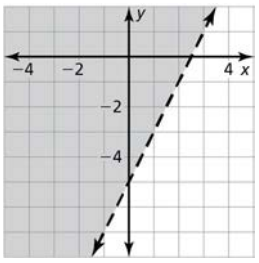
2. 39° **3.** $f(x) = 6x - 7$

4. $x = 26, y = 128°$

5.

STATEMENTS	REASONS
1. E is the midpoint of $\overline{AC}$ and $\overline{BD}$.	**1.** Given
2. $\overline{AE} \cong \overline{CE}$ and $\overline{BE} \cong \overline{DE}$	**2.** Definition of midpoint
3. $\angle AEB \cong \angle CED$	**3.** Vertical Angles Congruence Theorem
4. $\triangle AEB \cong \triangle CED$	**4.** SAS Congruence Theorem

6.



7. no; The corresponding vertices are not written in the same order.

5.6 Review & Refresh

1. (−1, −2)

2. Either the pair of corresponding third sides are congruent or the pair of corresponding included angles are congruent.

3. $\overline{QP}$, $\overline{QT}$;Converse of the Base Angles Theorem

4. QTR, QRT; Base Angles Theorem

5. 4 mm

6. yes; SAS Congruence Theorem

7. yes; ASA Congruence Theorem

8. yes; $\triangle LMN \cong \triangle PQR$ by the AAS Congruence Theorem

9. no; $\angle L$ and $\angle R$ do not correspond

5.7 Review & Refresh

1. From the diagram, $\overline{CD} \cong \overline{CA}$ and $\overline{CE} \cong \overline{CB}$. Also, $\angle DCE \cong \angle ACB$ by the Vertical Angles Congruence Theorem. So, by the SAS Congruence Theorem, $\triangle DCE \cong \triangle ACB$. Because corresponding parts of congruent triangles are congruent, $\angle B \cong \angle D$.

2. $8\sqrt{2}$, or about 11.3 units

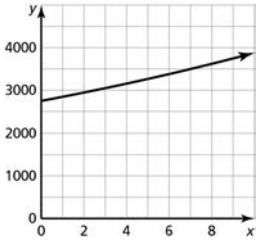
3. yes; AAS Congruence Theorem

4. yes; SSS Congruence Theorem

5. $x = 5$ **6.** $7m - 9$

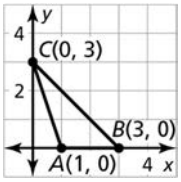
Answers

7. $y = 2750(1.035)^t$



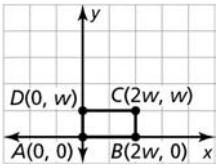
5.8 Review & Refresh

1. *Sample answer:*



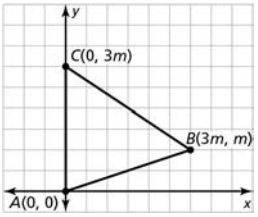
It is easy to find the lengths of horizontal and vertical segments and distances from the origin.

2. *Sample answer:*



It is easy to find the lengths of horizontal and vertical segments and distances from the origin.

3.



$AC = 3m$, $m_{\overline{AC}}$ = undefined, $M_{\overline{AC}} = \left(0, \frac{3m}{2}\right)$,

$BC = m\sqrt{13}$, $m_{\overline{BC}} = -\frac{2}{3}$, $M_{\overline{BC}} = \left(\frac{3m}{2}, 2m\right)$,

$AB = m\sqrt{10}$, $m_{\overline{AB}} = \frac{1}{3}$, $M_{\overline{AB}} = \left(\frac{3m}{2}, \frac{m}{2}\right)$; no;

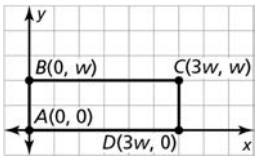
no; Because $m_{\overline{BC}} \cdot m_{\overline{AB}} \neq -1$, $\overline{BC}$ is not perpendicular to $\overline{AB}$. So, $\angle ABC$ is not a right angle and $\triangle ABC$ is not a right triangle. None of the sides are congruent because $AB \neq BC \neq AC$. So, $\triangle ABC$ is not an isosceles triangle.

4. Use the Distance Formula to find the side lengths RO, OP, PQ, and QR. So, $\overline{RO} \cong \overline{PQ}$ and $\overline{OP} \cong \overline{QR}$. Use the Reflexive Property of Segment Congruence to show that $\overline{PR} \cong \overline{RP}$. Finally, use the SSS Congruence Theorem to show that $\triangle OPR \cong \triangle QRP$.

5. $OE = \sqrt{h^2 + k^2}$, $OG = \sqrt{h^2 + k^2}$; $EF = \sqrt{9h^2 + k^2}$, $GF = \sqrt{9h^2 + k^2}$; $FO = 4h$
So, $\overline{OE} \cong \overline{OG}$, $\overline{EF} \cong \overline{GF}$, and $\overline{FO} \cong \overline{FO}$.
By the SSS Congruence Theorem, $\triangle OEF \cong \triangle OGF$.

6. Using the Distance Formula, $AB = \sqrt{746}$ in., $BC = \sqrt{674}$ in., and $CA = 18$ in.Because none of the sides are congruent, $\triangle ABC$ is a scalene triangle by definition. The table may be unstable because $\overline{AB}$ is longer than $\overline{BC}$. Move point C to (22, 0) so that $\triangle ABC$ is isosceles.

7.



8. $x = 8$

Chapter 5 B.E.S.T. Test Prep

1. D **2.** C

3. 2.4375 **4.** 9.8

5. B, D **6.** (2, 0.5)

7. A, C **8.** $\sqrt{b^2 + h^2}$ units

9. D **10.** A **11.** D

12. A **13.** C **14.** B

15. –2.75 **16.** B

17. B **18.** C **19.** A

20. B **21.** $\triangle LKJ$

Chapter 6

6.1 Review & Refresh

1. obtuse **2.** isosceles

Answers

3. 102°; Because the lines are parallel, $\angle 2$ and the 78° angle are supplementary by the Consecutive Interior Angles Theorem.

4. It is given that $\angle ADE \cong \angle CBE$ and $\overline{DE} \cong \overline{BE}$. By the Vertical Angles Congruence Theorem, $\angle CEB \cong \angle AED$. So, $\triangle AED \cong \triangle CEB$ by the ASA Congruence Theorem. Because corresponding parts of congruent triangles are congruent, $\angle DAE \cong \angle BCE$ and $\overline{AD} \cong \overline{CB}$. By the Reflexive Property of Segment Congruence, $\overline{CA} \cong \overline{AC}$. By the SAS Congruence Theorem $\triangle DAC \cong \triangle BCA$.

5. $-6x^7 + 24x^5 - 39x^4$

6. $\overline{ST} \cong \overline{WX}$; $\angle U \cong \angle Y$

7. 21; Because $FH = EH$ and $\overline{FE} \perp \overline{GH}$, point G is on the perpendicular bisector of $\overline{FE}$. By the Perpendicular Bisector Theorem, $FG = EG$. So, $4y - 15 = 2y + 3$ and the solution is $y = 9$. So, $EG = 2y + 3 = 2(9) + 3 = 21$.

8. 34°; Because $\overrightarrow{ML} \perp \overline{LP}$, $\overline{MN} \perp \overline{NP}$, and $\overline{LP} \cong \overline{NP}$, $\overrightarrow{MP}$ bisects $\angle LMN$ by the Converse of the Angle Bisector Theorem. So, by definition of angle bisector $\angle LMP \cong \angle NMP$. So, $m\angle LMP = m\angle NMP = 17°$, which means that $m\angle LMN = m\angle LMP + m\angle NMP = 17° + 17° = 34°$.

6.2 Review & Refresh

1. yes; $\triangle TUV$ is a translation 3 units right and 2 units down of $\triangle QRS$.

2. 86°; acute

3. It is given that $\overline{CD} \cong \overline{ED}$ and $\angle DFE$ is a right angle. Because $\angle DFE$ and $\angle DFC$ form a linear pair, $\angle DFC$ is a right angle. Therefore, $\triangle DFE$ and $\triangle DFC$ are right triangles. By the Reflexive Property of Segment Congruence, $\overline{DF} \cong \overline{DF}$. So, $\triangle DFE \cong \triangle DFC$ by the HL Congruence Theorem. Then, $\angle CDF \cong \angle EDF$ because corresponding parts of congruent triangles are congruent.

4. $4h^4(h - 4)(h + 4)$ **5.** 6

6. Using the Distance Formula, $XY = \sqrt{(5 - (-5))^2 + (3 - 1)^2} = 2\sqrt{26}$ and $YZ = \sqrt{(3 - 5)^2 + (-7 - 3)^2} = 2\sqrt{26}$. Because $XY = YZ$, $\triangle XYZ$ is isosceles.

7. $M(-3, 3)$; 6

8. linear; As x increases by 3, y decreases by 4.

6.3 Review & Refresh

1. 65°; Because $\overline{AD} \perp \overline{BA}$, $\overline{CD} \perp \overline{BC}$, and $\overline{AD} \cong \overline{CD}$, $\overrightarrow{BD}$ bisects $\angle ABC$ by the Converse of the Angle Bisector Theorem. So, by definition of angle bisector $\angle ABD \cong \angle CBD$. So, $m\angle ABD = m\angle CBD$, which means that $(13 - 2x)° = (7 - 3x)°$ and the solution is $x = -6$. Then $m\angle CBD = (7 - 3x)° = (7 - 3(-6))° = 25°$. Because $\triangle CBD$ is a right triangle, $m\angle BDC = 90° - 25° = 65°$.

2. (0, 1.5) **3.** inside; (−1, 6) **4.** no

5. (3, −5) **6.** (1, −1) **7.** $\left(0, 1\frac{2}{3}\right)$

8. $n = \pm 5i$ **9.** $x = -2 \pm \sqrt{19}$

10.

		Cross Country Team		
		Try Out	**Not Try Out**	**Total**
Gender	**Female**	28	67	95
	Male	21	72	93
	Total	49	139	188

11. *Sample answer:* It is given that $\overline{WY} \perp \overline{XZ}$. So, $\angle YWX$ and $\angle YWZ$ are right angles, which means $\triangle WXY$ and $\triangle WZY$ are right triangles. Next, find XY and ZY using the Distance Formula. Then, $\overline{XY} \cong \overline{ZY}$ by the definition of congruent segments. Use the Reflexive Property of Segment Congruence to show that $\overline{YW} \cong \overline{YW}$. Finally, prove that $\triangle WXY \cong \triangle WZY$ by the HL Congruence Theorem.

Answers

6.4 Review & Refresh

1. *Sample answer:* $-3 + 1 = -2$, and $-2 < 0$

2. 41; Because $\overline{ML} \cong \overline{KL}$ and $\overleftrightarrow{JL} \perp \overline{MK}$, point L is on the perpendicular bisector. By the Perpendicular Bisector Theorem, $\overline{JM} \cong \overline{JK}$. So, $JM = JK$, which means $4x + 17 = 7x - 1$ and the solution is $x = 6$. Then, $JK = 7x - 1 = 7(6) - 1 = 41$.

3. (5, 3) **4.** 11

5. $x = 6, y = 18$

6. $y = \begin{cases} 40, & 0 < x \le 3 \\ 50, & 0 < x \le 6 \\ 60, & 6 < x \le 9 \\ 70, & 9 < x \le 12 \end{cases}$; \$60

7. linear; The function is of the form $y = mx + b$.

8. nonlinear; The function is a quadratic function.

9. $D(1, 6)$, $E(4, 4.5)$, $F(2, 2.5)$

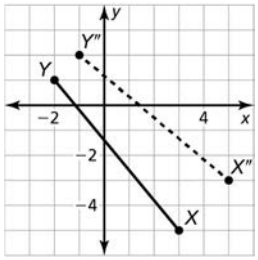
6.5 Review & Refresh

1. $(-1, 4)$, $(0, 2)$, $(3, 5)$

2. $k = \frac{3}{2}$ **3.** 2

4. outside; (12, 5)

5.



6. yes; ASA Congruence Theorem

7. 14

8. *Sample answer:*

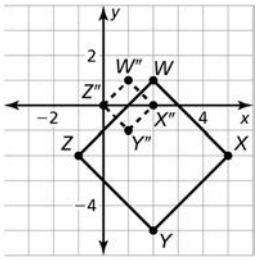
Equation	Explanation and Reason
$\frac{2}{5}x - \frac{4}{3}y = 2$	Write the equation. Given
$6x - 20y = 30$	Multiply each side by 15. Multiplication Property of Equality
$-20y = -6x + 30$	Subtract $6x$ from each side. Subtraction Property of Equality
$y = \frac{3}{10}x - \frac{3}{2}$	Divide each side by -20. Division Property of Equality

9. $\angle B, \angle C, \angle A$

6.6 Review & Refresh

1. $x = 32$ **2.** $x = 10.5$

3.



4. $\overline{AB}$; By the Hinge Theorem, because $\overline{AB}$ is the third side of the triangle with the larger included angle, it is longer than $\overline{QR}$.

5. a. circumcenter

b. no; This point is not equidistant from the sidewalks. The incenter would be equidistant from the three sidewalks.

6. The angle measures must be less than 31° by the Hinge Theorem.

Chapter 6 B.E.S.T. Test Prep

1. 14.6 **2.** A **3.** C **4.** D

5. B **6.** 37 in. **7.** B **8.** D

9. A **10.** 12.2 **11.** A **12.** D

13. $y = 2x + 3$ **14.** A, D, F

15. D, E **16.** D **17.** C **18.** D

19. C **20.** D **21.** A **22.** C

Answers

Chapter 7

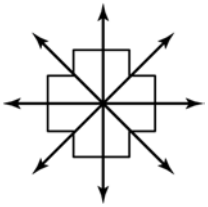
7.1 Review & Refresh

1. $x = 118$ **2.** $x = 98$

3. $m\angle 1$; By the Converse of the Hinge Theorem, $\angle 1$ is the included angle in the triangle with the longer third side, so its measure is greater than that of $\angle 2$.

4. 8 ft $< x <$ 20 ft **5.** $y = \frac{1}{4}x - 7$

6. yes



A reflection in any of the lines of symmetry maps the polygon onto itself.

7. $x = 13.5$ **8.** 15-gon

9. 155° **10.** $x = 50$

7.2 Review & Refresh

1. $\overline{BC}$, $\overline{AB}$, $\overline{AC}$

2. 17.2; By the Parallelogram Opposite Sides Theorem, $\overline{QR} \cong \overline{ST}$.

3. 85°; By the Parallelogram Opposite Angles Theorem, $\angle S \cong \angle Q$.

4. 95°; By the Parallelogram Consecutive Angles Theorem, $\angle T$ and $\angle Q$ are supplementary. So, $m\angle T = 180° - 85° = 95°$.

5. $x = 96$ **6.** $y = -x$ **7.** $(-2.25, 3.5)$

8. yes; Consecutive Interior Angles Converse

9. $m\angle CBD > m\angle ADB$ by the Converse of the Hinge Theorem.

7.3 Review & Refresh

1.

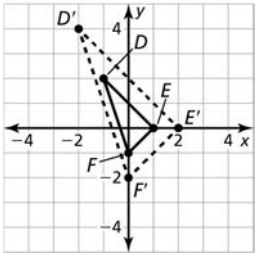
Equation	Explanation and Reason
$4 - 2y = 5 - 6x$	Write the equation; Given
$-2y = 1 - 6x$	Subtract 4 from each side; Subtraction Property of Equality
$y = 3x - \frac{1}{2}$	Divide each side by –2; Division Property of Equality

2. $x = 84$

3. $\sqrt{178}$, or about 13.3 units

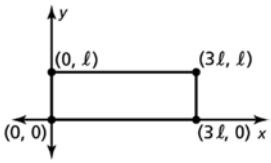
4. $D(-6, -2)$

5.



6. Opposite Sides Parallel and Congruent Theorem

7.



$\ell\sqrt{10}$ units

7.4 Review & Refresh

1. $A'(-2, 6)$

2. $B(0, 4)$

3. A segment is a midsegment of a triangle if and only if the segment connects the midpoints of two sides of the triangle.

4. $x = 12, y = 14$

5. $x = 6, y = 3$ **6.** 168°, 12°

7. $6 + \sqrt{5} + \sqrt{17}$, or about 12.4 units; 3 square units

8. yes; $\triangle DEF \cong \triangle QRS$ by the AAS Congruence Theorem.

Answers

9. $AB = 12$; $\overline{AB} \cong \overline{CB}$ by the Converse of the Perpendicular Bisector Theorem, so $2x = 3(x - 2)$. The solution is $x = 6$, so $AB = 2x = 2(6) = 12$.

7.5 Review & Refresh

1. yes

2. $7\sqrt{2}$, or about 9.9 units

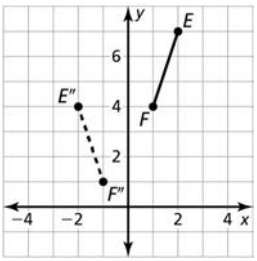
3. rectangle

4. $DB = 12$; By the Parallelogram Diagonals Theorem, $DE = EB$. So, $DB = DE + EB = 6 + 6 = 12$.

5. Parallelogram Opposite Angles Converse

6. 538 feet

7.



8. $m\angle K = m\angle L = 106°$, $m\angle J = m\angle M = 74°$

Chapter 7 B.E.S.T. Test Prep

1. 14.2 **2.** 154.5 **3.** B

4. A **5.** D **6.** C

7. C, E, F **8.** A, B, E **9.** B

10. $3\sqrt{2} + \sqrt{10}$, or about 7.4 units

11. A **12.** D **13.** B

14. 13 **15.** 60 **16.** (3, 6)

17. C **18.** A **19.** A

20. B **21.** B, D, E **22.** D

Chapter 8

8.1 Review & Refresh

1. $x = 63$ **2.** $x = 85$

3. 11 units **4.** $x = 53$, $y = 127$

5. $-(5x + 6)(x - 3)$ **6.** $(x - 2)(x^2 - 3)$

7. $x = 21$ **8.** quadratic

9. $x = 3$ **10.** $x = \pm\frac{3\sqrt{2}}{2}$ **11.** 8

12. 48 ft **13.** sometimes

8.2 Review & Refresh

1. yes; HL Congruence Theorem

2. yes; $\triangle ACD \sim \triangle ABE$; $\angle ADC \cong \angle AEB$ and $\angle ACD \cong \angle ABE$ by the Corresponding Angles Theorem, so $\triangle ACD \sim \triangle ABE$ by the AA Similarity Theorem.

3. a. 120°

b. 60°

4. 29° **5.** 324 ft^2

6. rectangle, rhombus, square

7. 27° **8.** 27° **9.** 63°

10. 3 **11.** $\frac{3}{2}$ **12.** $\triangle DGF$

8.3 Review & Refresh

1. The longest bar is parallel to the shortest bar by the Transitive Property of Parallel Lines.

2. $\angle B \cong \angle B$ and $\angle BAC \cong \angle BDA$, so $\triangle ABC \sim \triangle DBA$ by the AA Similarity Theorem

3. $P(1, 1.5)$ **4.** $9 < x < 23$

5. no; Because the input $x = 1$ has two outputs, $y = 1$ and $y = 3$, the relation is not a function.

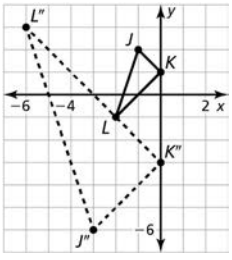
6. $y = \frac{1}{3}x + 7$

7. 118° **8.** 108°

9. yes; ASA Congruence Theorem

8.4 Review & Refresh

1.



Answers

2. Place the entrance at the incenter of the triangle.

3. $x = 12$ **4.** $b_1 = \frac{2A}{h} - b_2$

5. $\angle D \cong \angle M$ and $\angle F \cong \angle L$, so $\triangle DEF \sim \triangle MNL$ by the AA Similarity Theorem.

6. $x = 2$

7. $x = 3$ **8.** $b = 8$

9. 256 ft; If $\overline{BE} \parallel \overline{CF}$, then by the Three Parallel Lines Theorem, $\frac{AB}{BC} = \frac{DE}{EF}$. By substitution, $\frac{100}{320} = \frac{80}{EF}$ and $EF = 256$.

Chapter 8 B.E.S.T. Test Prep

1. A, C **2.** D **3.** D

4. 21 **5.** 82.5 **6.** (–4, 5)

7. B **8.** A, C, D **9.** D

10. $\frac{3}{2}$ or 1.5 **11.** C **12.** B

13. D **14.** A **15.** B

16. $x = 7$ **17.** A **18.** A

19. C **20.** D **21.** B

Chapter 9

9.1 Review & Refresh

1. $6\sqrt{3}$ **2.** $\frac{15 - 5\sqrt{2}}{7}$

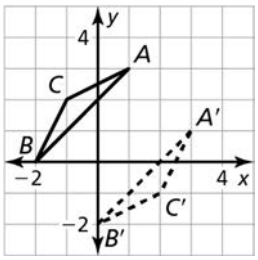
3. $m\angle A = m\angle B = 75°, m\angle D = 105°$

4. yes; Because $\overline{JL} \parallel \overline{MN}$, $\angle J \cong \angle KMN$ and $\angle L \cong \angle KNM$ by the Corresponding Angles Theorem. Then, $\triangle JKL \sim \triangle MKN$ by the AA Similarity Theorem.

5. no

6. $\frac{DE}{HI} = \frac{EF}{IG} = \frac{FD}{GH}$, so $\triangle DEF \sim \triangle HIG$ by the SSS Similarity Theorem.

7.



8. $x = 17$; yes

9.2 Review & Refresh

1. $x = 18$ **2.** yes; acute

3. $x = 9\sqrt{3}, y = 9$ **4.** $M(2, 1)$

5. yes; $\triangle ABC$ can be mapped to $\triangle DEF$ by a translation 3 units left and 1 unit down

6. The tiles with side lengths 5.6 cm, 5.6 cm, 8 cm and 3.5 cm, 3.5 cm, 5 cm are similar because the corresponding side lengths are proportional.

7. $X(3, 1)$

8. A quadrilateral is a trapezoid if and only if it has exactly one pair of parallel sides.

9. $x = \frac{\left(15\sqrt{2}\right)}{2}$

9.3 Review & Refresh

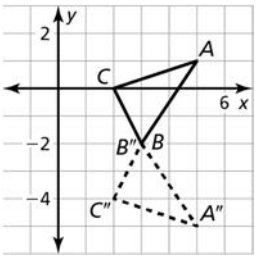
1. $x = 11$ **2.** 12 **3.** 19

4. $\sqrt{39} \approx 6.2$ ft

5. no **6.** $y = 4.5$

7. yes; $m\angle F = 180° - 70° - 42° = 68°$, $\angle E \cong \angle T$, and $\angle F \cong \angle U$, so $\triangle DEF \sim \triangle STU$ by the AA Similarity Theorem.

8.



9. $\triangle ABC \sim \triangle CBD \sim \triangle ACD$

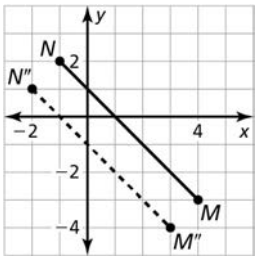
Answers

9.4 Review & Refresh

1. $x = 5\sqrt{5}$; no **2.** $8\sqrt{3}$

3. 6 square units

4.



5. $(-1, 0)$ **6.** $x = 12$

7. $x = 72$ **8.** $x \approx 9.0$

9. $x = 6\sqrt{3}$ **10.** $m\angle 2 = 60°$

9.5 Review & Refresh

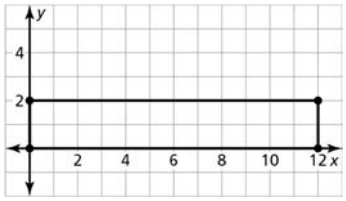
1. $x = \sqrt{39}$; no **2.** $x = 26$; no

3. sin 19° **4.** $x \approx 6.9$ **5.** 156.6°; 14.4°

6. $\triangle WXY \sim \triangle WZX \sim \triangle XZY; x = 2\sqrt{3}$

7. $x = \frac{4\sqrt{3}}{3}$, $y = \frac{8\sqrt{3}}{3}$ **8.** $x = 15, y = 4$

9.



$2\sqrt{37}$, or about 12.2 units

10. $P(2.4, 3.8)$

11. $\sin D = \frac{3}{5} = 0.6$; $\sin E = \frac{3}{5} = 0.6$;

$\cos D = \frac{4}{5} = 0.8$; $\cos E = \frac{4}{5} = 0.8$

9.6 Review & Refresh

1. $x = 8\sqrt{3}$ **2.** $x \approx 10.4$

3. $x = 5\sqrt{2}$ **4.** $x = 24$

5. $6 < x < 16$

6. yes; Quadrilateral $ABCD$ can be mapped to quadrilateral $EFGH$ by a reflection in the line $y = x$, followed by a translation 2 units right and 4 units down.

7. $x = -4$ **8.** $x \approx 27.2$, $y \approx 10.6$

9. Parallelogram Opposite Sides Converse

10. $(7, -1)$

11. $m\angle B \approx 53.1°$, $m\angle C \approx 36.9°$, $c = 6$

12. $m\angle A \approx 77.9°$, $m\angle B \approx 63.1°$, $a \approx 18.6$

13. $LM \approx 1.8$, $MN \approx 2.4$, $m\angle N = 38°$

14. $LXZ \approx 32.5$, $YZ \approx 37.1$, $m\angle Y = 61°$

Chapter 9 B.E.S.T. Test Prep

1. B **2.** D **3.** A, B

4. A, B, D **5.** C **6.** C

7. D **8.** D **9.** 15.825

10. 122.87 **11.** $\triangle EDC$ **12.** D

13. B **14.** C **15.** A

16. D **17.** cos 14° **18.** A

19. C **20.** C **21.** B

22. 7.16 **23.** A, C, D

Chapter 10

10.1 Review & Refresh

1. $m\angle U = 51°$, $ST \approx 6.2$, $SU \approx 7.9$

2. $c \approx 11.0$, $m\angle A \approx 45.0°$, $m\angle B \approx 32.0°$

3. 108° **4.** 13

5. parallel **6.** $x = 8$

7. about 5.46 ft **8.** $AP = 28$, $DP = 14$

9. $r = \frac{9}{4}$ **10.** $x = 9$

11. a. 40 ft; By the External Tangent Congruence Theorem, the sidewalks are the same length.

b. 60 ft

Answers

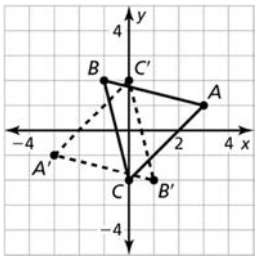
10.2 Review & Refresh

1. $x = -1,\ x = \frac{9}{2}$ **2.** $x = -1,\ x = \frac{9}{2}$

3. $\sqrt{53}$, or about 7.3 ft **4.** $12\sqrt{5}$

5. $x = 5\sqrt{2}$ **6.** $x = 120$

7.



8. 58°; By the Converse of the Angle Bisector Theorem, $\overline{BD}$ bisects $\angle ABC$. So, $m\angle ABD = m\angle CBD$ and $(4x - 7)° = (2x + 11)°$, which has the solution $x = 9$. So,

$$\begin{aligned} m\angle ABCD &= 2(m\angle ABD) \\ &= 2(4x - 7)° \\ &= 2[4(9) - 7]° \\ &= 58°. \end{aligned}$$

9. 79.2° **10.** 198° **11.** 270°

10.3 Review & Refresh

1. $x = 7$ **2.** 96° **3.** 145°

4. congruent; The circles are congruent and the arcs have congruent central angles.

5. about 218.1 m **6.** 137°

7. yes; $\triangle ACE \cong \triangle ADE$ by the SSS Congruence Theorem, so $\angle AEC$ and $\angle AED$ are right angles. So, $\overline{AB}$ is a perpendicular bisector of $\overline{CD}$, and $\overline{AB}$ is a diameter of the circle by the Perpendicular Chord Bisector Converse

8. 5

10.4 Review & Refresh

1. Sample answer: A 90° rotation about the origin, followed by a translation 3 units right and 2 units up maps $\triangle ABC$ to $\triangle DEF$.

2. 5 **3.** minor arc; 50°

4. semicircle; 180° **5.** major arc; 310°

6. no; $\triangle ABC$ is not a right triangle.

7. 87° **8.** 35°

9. your friend; First, use linear pairs to find the included angles formed by the paths you and your friend take. The included angle formed by your path is $180° - 30° = 150°$. The included angle formed by your friend's path is $180° - 15° = 165°$. Because $165° > 150°$, your friend's distance from the school is greater than your distance by the Hinge Theorem.

10. $\angle A \cong \angle D, \angle B \cong \angle C$

11. $m = 115, n = 80$ **12.** $a = 28.5, b = 10$

10.5 Review & Refresh

1. $21 + \sqrt{233}$,or about 36.3 units; 52 square units

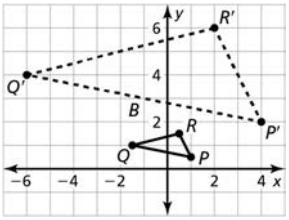
2. 53°l Because the measure of the entire circle is 360, $m\overset{\frown}{AC} = 360° - m\overset{\frown}{AB} - m\overset{\frown}{BC}$

$$\begin{aligned} &= 360 - 180° - 127° \\ &= 53°. \end{aligned}$$

3. $x = 109$ **4.** $x = 259$

5. 47.5° **6.** 119°

7.



8. 140° **9.** 144° **10.** 52°

11. $x = 20$ **12.** $x = 148$ **13.** $x = 50$

10.6 Review & Refresh

1. 53 **2.** about 5.5 m

3. 16 **4.** 164° **5.** 136°

6. $m\angle F = 180° - 121° - 42° = 17°$. So, $\angle F \cong \angle EGH$. $\angle E \cong \angle E$ by the Reflexive Property of Angle Congruence. So, $\triangle EGH \sim \triangle EFG$ by the AA Similarity Theorem.

7. $x = 13$; By the Consecutive Interior Angles Converse, $m \parallel n$ when the 49° angle is supplementary to the $(9x + 14)°$ angle. So, $49 + 9x + 14 = 180$, and $x = 13$.

Answers

8. 11.2 ft **9.** about 14.2 ft

10.7 Review & Refresh

1. $(x + 3)^2 + (y - 5)^2 = 169$

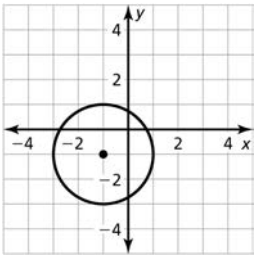
2. $x = 91$ **3.** $x = 3$

4. major arc; 265° **5.** minor arc; 122°

6. major arc; 238° **7.** semicircle; 180°

8. 64° **9.** 118° **10.** $x = 5$

11. center: $(-1, -1)$, radius: 2



12. The radius of the circle is $3\sqrt{2}$.
$\sqrt{[-1 - (-4)]^2 + [2 - (-1)]^2} = 3\sqrt{2}$, so $(-1, 2)$ does lie on the circle.

Chapter 10 B.E.S.T. Test Prep

1. D **2.** A

3. $(x + 5)^2 + (y - 12)^2 = 25$

4. D **5.** D **6.** B, D, F

7. B **8.** D **9.** B

10. C **11.** A, D **12.** C

13. A **14.** −25 **15.** 17.867

16. B **17.** B **18.** 36

19. C **20.** B **21.** A

22. A **23.** C

24. $X'(-8, 4)$, $Y'(12, -4)$, $Z'(4, 16)$

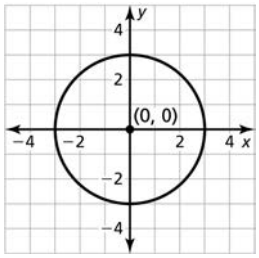
Chapter 11

11.1 Review & Refresh

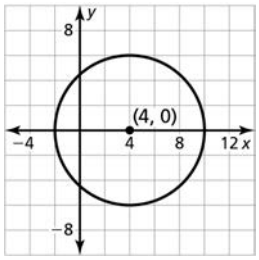
1. 30 units^2 **2.** 72 units^2

3. 8.5

4. center: (0, 0) radius: 3



5. center: (4, 0) radius: 6



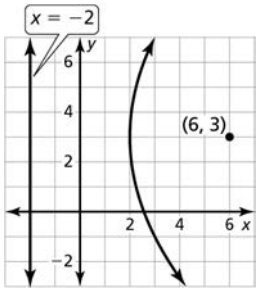
6. $x = 15.4$ **7.** $x = 10$ **8.** 24

11.2 Review & Refresh

1. about 9.13 ft^2 **2.** about 110.01°

3. 46°

4. focus: (6, 3), directrix: $x = -2$, axis of symmetry: $y = 3$



5. $3\sqrt{5}$, or about 6.7 units

6. $DE = 9$, $BE = 27$

7. By the AAS Congruence Theorem, the right triangles that represent each half of the pediment are congruent. Because corresponding parts of congruent triangles are congruent, the lengths of both sides of the pediment are the same.

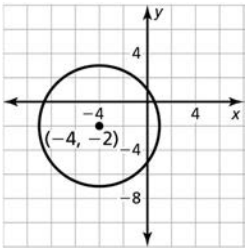
8. 17 **9.** $y = \frac{1}{2}x + 3$

11.3 Review & Refresh

1. about 26.53 m^2 **2.** about 4.92 ft

Answers

3. domain: $-9 \le x \le 1$; range: $-7 \le y \le 3$



4. yes; *Sample answer:* $\triangle ABC$ maps to $\triangle DEF$ by a dilation with a scale factor of 2, followed by a translation 2 units right and 1 unit down.

5. $x \approx 4.6$ **6.** $x = 4.5$

7. about 1527.67 square units

8. a. Parallelogram Opposite Sides Converse
b. 130°, 130°, 50°

9. 107°

11.4 Review & Refresh

1. about 199.57°

2. about 83.41 in.^{2}; about 171.06 in.^{2}

3. about 68.41 square units

4. about 12.2 mi **5.** 150 m, 120 m

6. $JL < SQ$; Because $\overline{JL}$ is the third side of the triangle with the smaller included angle, it is shorter than $\overline{SQ}$ by the Hinge Theorem.

7. $a \approx 34.2$, $b \approx 14.5$ **8.** 3780°

9. 40

Chapter 11 B.E.S.T. Test Prep

1. A **2.** D **3.** A

4. D **5.** B **6.** B

7. A, B, D, F **8.** C **9.** B

10. B **11.** $y = \frac{1}{8}(x - 2)^2 + 3$

12. B **13.** C

14. 146.3 **15.** 31.36 yd^2

16. 6.79 m **17.** 10.27 m^2

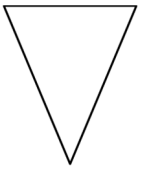
18. C **19.** B **20.** A, C, E **21.** A, E

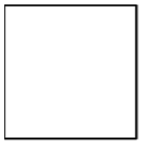
Chapter 12

12.1 Review & Refresh

1. It is given that $\overline{QU} \cong \overline{TU}$. First, $\overline{RU} \cong \overline{SU}$ by the Converse of the Base Angles Theorem. Then $\angle QUR \cong \angle TUS$ by the Vertical Angles Congruence Theorem. $\triangle QUR \cong \triangle TUS$ by the SAS Congruence Theorem. Finally, $\overline{QR} \cong \overline{TS}$ because corresponding parts of congruent triangles are congruent.

2. 18 oz per yd^2

3. 
triangle

4. 
square

5. yes; Because $60^2 + 91^2 = (60 + 49)^2$, $\triangle ABC$ is a right triangle.

6. $X(-2, -3)$

7. $DE \approx 24.6$, $EF \approx 8.5$, $m\angle F = 71°$

8. $29 + 34 > 51$; obtuse

9. 142.5 units^2 **10.** 40 units^2

12.2 Review & Refresh

1. $x = 17$, $y = 7$

2. no **3.** yes; triangular pyramid

4. yes; $m\angle P = 74°$, so $\triangle PQR \sim \triangle STU$ by the AA Similarity Theorem.

5. $x = 7$ **6.** about 863.3 mi

7. about 229.9 m^2 **8.** about 2.45 ft^2

9. about 268.4 units^2

12.3 Review & Refresh

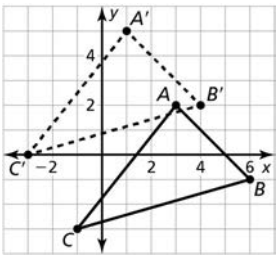
1. $x \approx 14.4$ **2.** $x \approx 7.2$

3. 6.25 in.^{2} **4.** about 23.3 m^2

5. 1200 in.^{2} **6.** hexagon

Answers

7.



8. yes; The campsite is 100 feet from the trail.

9. If it is Saturday, then it is the weekend; true; If it is not the weekend, then it is not Saturday; true

12.4 Review & Refresh

1. 64π, or about 201.1 m^2 **2.** 36 in.

3. 52 m^3 **4.** about 376.8 $in.^3$

5. 54 yd^3 **6.** 10.5 cm^3

7. about 188.5 $in.^3$ **8.** 46.8 ft, 130 ft

9. about 10.1 in., about 8.0 $in.^2$

10. yes; The arcs are in the same circle and $m\overset{\frown}{XY} = m\overset{\frown}{YZ}$.

12.5 Review & Refresh

1. $m\angle A = 107.0°$, $m\angle C = 56.0°$, $b \approx 4.6$

2. $m\overset{\frown}{AC} \approx 20.2°$ **3.** 312 m^2

4. $h \approx 12$ m **5.** 47 units

6. yes; $\frac{SR}{RQ} = \frac{ST}{TU}$, so $\overline{RT} \parallel \overline{QU}$ by the Converse of the Triangle Proportionality Theorem.

7. about 452.9 ft^2 **8.** about 3078.8 yd^2

12.6 Review & Refresh

1. Because $m_{\overline{WX}} = -\frac{5}{3}$ and $m_{\overline{YZ}} = -\frac{5}{3}$, $\overline{WX} \parallel \overline{YZ}$. Because $m_{\overline{XY}} = 9$ and $m_{\overline{WZ}} = -\frac{1}{7}$, $\overline{XY}$ is not parallel to $\overline{WZ}$. The quadrilateral has exactly one pair of parallel sides, so it is a trapezoid; Because $XY = \sqrt{82}$ and $WZ = 5\sqrt{2}$, the trapezoid is not isosceles.

2. 1715π ft^2

3. about 7854.0 $in.^2$, about 65,449.8 $in.^3$

4. about 213.6 cm^3

5. about 3631.7 mm^2; about 20,579.5 mm^3

6. yes; It is given that $\overline{PS} \cong \overline{RS}$ and $\angle PSQ$ is a right angle. Because $\angle PSQ$ and $\angle RSQ$ form a linear pair, $\angle RSQ$ is a right angle. So, $\angle PSQ \cong \angle RSQ$ by the Right Angle Congruence Theorem. By the Reflexive Property of Segment Congruence, $\overline{QS} \cong \overline{QS}$. So, $\triangle PQS \cong \triangle RQS$ by the SAS Congruence Theorem.

7. $x = 12\sqrt{3}$ **8.** $x = 5\sqrt{2}$

12.7 Review & Refresh

1. $\sin D = \frac{5}{13}$, or about 0.39; $\sin E = \frac{5}{13}$, or about 0.39; $\cos D = \frac{12}{13}$, or about 0.92; $\cos E = \frac{12}{13}$, or about 0.92

2. $\frac{7\sqrt{2}}{2}$ **3.** 49.152 m^3

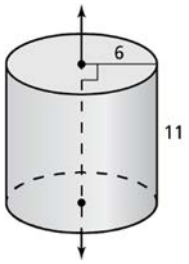
4. about 172.9 g **5.** 1156π $in.^2$; 6551π $in.^3$

6. about 2671.9 g

12.8 Review & Refresh

1. about 10 miles

2.



3. about 2.4 g **4.** $x = \sqrt{119}$; no

5. about 581.1 $in.^2$ **6.** about 1205.3 ft^3

7. about 1 h and 24 min

8. $(x + 4)^2 + (y - 3)^2 = 4$

Chapter 12 B.E.S.T. Test Prep

1. 57,905.8 **2.** 189,400 **3.** B

4. A **5.** A, D **6.** D

Answers

7. C **8.** C, E, F **9.** B

10. C **11.** A, B **12.** A

13. B **14.** A **15.** rectangle

16. D **17.** B **18.** D

19. B **20.** B **21.** A

Post-Course Test

1. A, D **2.** C **3.** C

4. A, C **5.** A, D, E, F

6. $y = \frac{2}{5}x + \frac{17}{5}$ **7.** A

8. 2.16 **9.** 117.92

10. D **11.** B **12.** B

13. $\triangle DBE$ **14.** D, E **15.** A

16. D **17.** C **18.** B

19. B **20.** A **21.** B

22. D **23.** B **24.** C

25. C **26.** D **27.** B

28. $y = \frac{2}{3}x - 5$

29. A **30.** 4.47 **31.** D **32.** $\frac{4}{5}$

33. 21.4

34. $(x - 8)^2 + (y - 3)^2 = 34$

35. B **36.** A **37.** B, C, D

38. 40 **39.** 5940

40. $7 < x < 13$ **41.** B

42. B **43.** A

44. A, B, D **45.** D **46.** 32

47. C **48.** B

Geometric Reasoning

MA.912.GR.1.1

1. a. $\angle 1$ and $\angle 5$, $\angle 2$ and $\angle 6$, $\angle 3$ and $\angle 7$, $\angle 4$ and $\angle 8$

b. $\angle 4$ and $\angle 6$, $\angle 3$ and $\angle 5$

c. $\angle 1$ and $\angle 7$, $\angle 2$ and $\angle 8$

d. $\angle 4$ and $\angle 5$, $\angle 3$ and $\angle 6$

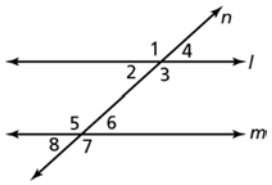
e. $\angle 1$ and $\angle 3$, $\angle 2$ and $\angle 4$, $\angle 5$ and $\angle 7$, $\angle 6$ and $\angle 8$

2. $\angle 3$, $\angle 5$, $\angle 7$: 84°; $\angle 2$, $\angle 4$, $\angle 6$, $\angle 8$: 96°

3.

STATEMENTS	REASONS
1. $\angle 1$ and $\angle 2$ form a linear pair. $\angle 2$ and $\angle 3$form a linear pair.	**1.** Definition of linear pair
2. $m\angle 1 + m\angle 2 = 180^\circ$ $m\angle 2 + m\angle 3 = 180^\circ$	**2.** Linear Pair Property
3. $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	**3.** Transitive Property of Equality
4. $m\angle 1 = m\angle 3$	**4.** Subtraction Property of Equality

4.



STATEMENTS	REASONS
1. $\ell \parallel m$	**1.** Given
2. $\angle 1 \cong \angle 3$	**2.** Vertical Angle Theorem
3. $\angle 1 \cong \angle 5$	**3.** Corresponding Angle Postulate
4. $\angle 3 \cong \angle 5$	**4.** Transitive Property of Congruence

MA.912.GR.1.2

1. a. $\angle A$ and $\angle D$, $\angle B$ and $\angle E$, $\angle C$ and $\angle F$

b. $\overline{AB}$ and $\overline{DE}$, $\overline{BC}$ and $\overline{EF}$, $\overline{CA}$ and $\overline{FD}$

2. a. 27°

b. 18

Answers

3.

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{DB}$; $\overline{BE} \cong \overline{BC}$	**1.** Given
2. $\angle ABE \cong \angle DBC$	**2.** Vertical Angle Theorem
3. $\triangle ABE \cong \triangle DBC$	**3.** SAS Congruence Theorem

4.

STATEMENTS	REASONS
1. $\angle FKG \cong \angle FJH$	**1.** Given
2. $\angle F \cong \angle F$	**2.** Reflexive Property of Congruence
3. $\triangle FGK \sim \triangle FHJ$	**3.** AA Similarity Theorem

MA.912.GR.1.3

1. a. angles that form linear pairs with the interior angles of a polygon

b. the two angles adjacent to the bases of an isosceles triangle.

c. the point that divides a segment into two congruent segments

d. a segment from a vertex of a triangle to the midpoint of the opposite side.

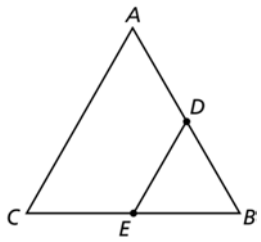
2. a. 53°

b. 107°

3.

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{CB}$	**1.** Given
2. $\angle ABC \cong \angle CBA$	**2.** Reflexive Property of Congruence
3. $\triangle ABC \cong \triangle CBA$	**3.** SAS Triangle Congruence Theorem
4. $\angle A \cong \angle C$	**4.** Corresponding parts of congruent triangles are congruent.

4.



STATEMENTS	REASONS
1. D is the midpoint of $\overline{AB}$ E is the midpoint of $\overline{BC}$	**1.** Given
2. $DB = \frac{1}{2}AB$, $BE = \frac{1}{2}BC$	**2.** Property of Midpoints
3. $\angle B \cong \angle B$	**3.** Reflexive Property of Congruence
4. $\triangle ABC \sim \triangle DBE$	**4.** SAS Similarity Theorem
5. $\angle BAC \cong \angle BDE$	**5.** Corresponding parts of congruent triangles are congruent.
6. $\overline{DE} \parallel \overline{AC}$	**6.** Corresponding angle postulate

MA.912.GR.1.4

1. a. $\overline{AB}$ and $\overline{CD}$

b. $\overline{EF}$ and $\overline{GH}$, $\overline{FG}$ and $\overline{EH}$

c. none

2. $m\angle F = 118^\circ$, $m\angle G = 62^\circ$, $m\angle H = 118^\circ$, $GH = 10$, $HE = 14$

Answers

3.

STATEMENTS	REASONS
1. $ABCD$ is a parallelogram.	**1.** Given
2. $\overline{AB} \parallel \overline{CD}$, $\overline{AD} \parallel \overline{BC}$	**2.** Definition of parallelogram
3. $\angle A$ and $\angle B$ are consecutive interior angles. $\angle B$ and $\angle C$ are consecutive interior angles.	**3.** Definition of consecutive interior angles
4. $m\angle A + m\angle B = 180°$ $m\angle B + m\angle C = 180°$	**4.** Consecutive Interior Angles Theorem
5. $m\angle A + m\angle B = m\angle B + m\angle C$	**5.** Transitive Property of Equality
6. $m\angle A = m\angle C$	**6.** Subtraction Property of Equality
7. $\angle A \cong \angle C$	**7.** Definition of congruent angles

4. Check students' work.

MA.912.GR.1.5

1. a. $\overline{AB}$ and $\overline{CD}$

b. $\overline{AC}$ and $\overline{BD}$

2. $m\angle F = 106^\circ$, $m\angle G = 106^\circ$, $m\angle H = 74^\circ$

3.

STATEMENTS	REASONS
1. $ABCD$ is a trapezoid. $\overline{AB} \cong \overline{CD}$	**1.** Given
2. $\overline{AD} \cong \overline{DA}$	**2.** Reflexive Property of Congruence
3. $\angle A \cong \angle D$	**3.** Base angles of an isosceles trapezoid are congruent.
4. $\triangle ACD \cong \triangle DBA$	**4.** SAS Triangle Congruence Theorem
5. $\overline{AC} \cong \overline{DB}$	**5.** Corresponding parts of congruent triangles are congruent.

4. 13

MA.912.GR.1.6

1. $\overline{AB} \cong \overline{ED}$, $\overline{BC} \cong \overline{DC}$, $\overline{AC} \cong \overline{EC}$, $\angle BAC \cong \angle DEC$, $\angle ABC \cong \angle EDC$, $\angle BCA \cong \angle DCE$

2. 3

3. 47°

4. 7.5 in.

MA.912.GR.2.1

1. a. translation

b. reflection

c. rotation

2. a. reflection across the x-axis

b. dilations with scale factor 2

c. translation 2 units right and 5 units down

3. a. translation 3 units left and 4 units down

b. $(x, y) \rightarrow (x - 3, y - 4)$

4. translation 4 units right followed by reflection across x-axis; rotation 180° clockwise followed by reflection across the line $x = 2$.

MA.912.GR.2.2

1. a. a transformation that moves every point of a figure the same distance in the same direction

b. a transformation in which a figure is turned about a fixed point

c. a transformation that uses a line like a mirror to reflect a figure

d. a transformation in which a figure is enlarged or reduced with respect to a fixed point

2. a. no

b. yes

c. yes

d. yes

3. a. yes

b. yes

4. a. no

b. yes

Answers

MA.912.GR.2.3

1. a. no

b. yes

c. yes

d. yes

2. translation 5 units right followed by reflection across the x-axis

3. a. rotations of 120° and 240°, reflection across perpendicular bisector of each side

b. reflection across vertical diagonal

c. rotations of 60°, 120°, 180°, 240°, and 300°, reflections across perpendicular bisectors of each side, reflections across diagonals joining opposite vertices

4. Check students' work.

MA.912.GR.2.4

1. a. A figure has line symmetry when the figure can be mapped onto itself by a reflection in a line.

b. A figure has rotational symmetry when the figure can be mapped onto itself by a rotation of 180° or less about the center of the figure.

2. a. line symmetry

b. rotational symmetry

c. translation symmetry

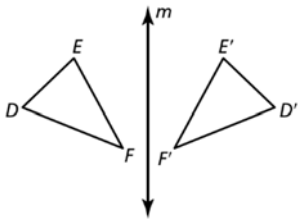
3. symmetry of reflection on any line through a vertex perpendicular to the opposite side; symmetry of rotation; 72°, 144°, 216°, 288°

4. Check students' work.

MA.912.GR.2.5

1. reflection across the y-axis

2.



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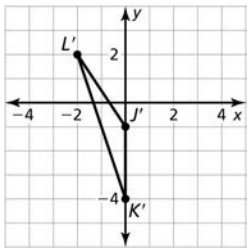
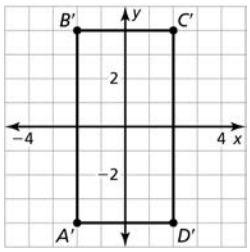


4.



MA.912.GR.2.6

1. $\angle A \cong \angle K$, $\angle B \cong \angle M$, $\angle C \cong \angle L$
$\overline{AB} \cong \overline{KM}$, $\overline{BC} \cong \overline{ML}$, $\overline{AC} \cong \overline{KL}$

2. a. 50°

b. 70°

c. 3 in.

3. rotate $\triangle ABC$ 180° about the origin

4. translation 4 units right and reflection across the x-axis

MA.912.GR.2.7

1. $\overline{JK}$ and $\overline{QR}$, $\overline{KL}$ and $\overline{RP}$, $\overline{JL}$ and $\overline{QP}$
$\angle J$ and $\angle Q$, $\angle K$ and $\angle R$, $\angle L$ and $\angle P$

2. a. SAS

b. SSS

c. ASA

3. Translate $\triangle ABC$ so that point A coincides with point D. Rotate $\triangle ABC$ about point A so that $\overline{AB}$ aligns with $\overline{DE}$. Because a rigid motion preserves length, point B will coincide with point E. Because a rigid motion preserves angle measure, $\overline{BC}$ will align with $\overline{EF}$, and $\overline{AC}$ will align with $\overline{DF}$. Point C must lay on both $\overrightarrow{EF}$ and $\overrightarrow{DF}$, which means that point C must align with point F. Since the vertices of $\triangle ABC$ and $\triangle DEF$ align, the triangles must be congruent.

Answers

4. Translate $\triangle ABC$ so that point A coincides with point D. Rotate $\triangle ABC$ about point A so that $\overline{AB}$ aligns with $\overline{DE}$. Because $\overline{AB} \cong \overline{DE}$, point B will coincide with point E. Because rigid motions preserve angle measure and $\angle A \cong \angle D$, $\overline{AC}$ will align with $\overline{DF}$. Because rigid motions preserve length and $\overline{AC} \cong \overline{DF}$, point C must coincide with point F. Because all three vertices coincide, $\triangle ABC \cong \triangle DEF$.

MA.912.GR.2.8

1. $\angle J$ and $\angle P$, $\angle K$ and $\angle R$, $\angle L$ and $\angle Q$
$\overline{JK}$ and $\overline{PR}$, $\overline{KL}$ and $\overline{RQ}$, $\overline{JL}$ and $\overline{PQ}$

2. a. 41°
b. 79°
c. 8

3. dilate $\triangle ABC$ by a scale factor of $\frac{3}{2}$ centered at the origin

4. a. dilation with scale factor of $\frac{5}{2}$
b. 3.5 cm
c. 48°

MA.912.GR.2.9

1. $\overline{JK} \cong \overline{QR}$, $\overline{KL} \cong \overline{RP}$, $\overline{JL} \cong \overline{QP}$
$\angle J \cong \angle Q$, $\angle K \cong \angle R$, $\angle L \cong \angle P$

2. a. SSS
b. SAS
c. ASA

3. Translate $\triangle ABC$ so that point A coincides with point D. Rotate $\triangle ABC$ about point A so that $\overline{AB}$ aligns with $\overline{DE}$. Dilate $\triangle ABC$ with center point D until point B coincides with point E. Because a dilation preserves angle measurements, $\overline{AC}$ will lie along $\overrightarrow{DF}$ and $\overline{BC}$ will lie along $\overrightarrow{EF}$. Therefore, point C must coincide with point F. $\overline{AC}$ and $\overline{BC}$ were dilated by the same scale factor as $\overline{AB}$, so all three sides of the triangles are in the same proportion, and $\triangle ABC \sim \triangle DEF$.

4. Translate $\triangle ABC$ so that point A coincides with point D. Rotate $\triangle ABC$ about point A so that $\overline{AB}$ aligns with $\overline{DE}$. Dilate $\overline{AB}$ by scale factor 2 with center D. This will cause point B to coincide with point E. Because the transformations preserve angle measure, $\overline{AC}$ will align with $\overline{DF}$.. Because $\overline{AC}$ was dilated by a scale factor of 2, point C will coincide with point F. Because the points coincide, all angle measures must be equal and all sides must be proportional.

MA.912.GR.3.1

1. 8.6 **2.** 7.48 **3.** (1, 3) **4.** 5

MA.912.GR.3.2

1. a. $\frac{y_2 - y_1}{x_2 - x_1}$
b. $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
c. $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

2. a. $-\frac{12}{5}$ units
b. 26
c. $(-2, 8)$

3. isosceles right triangle; The slope of $\overleftrightarrow{AB}$ is -4 and the slope of $\overleftrightarrow{AC}$ is $\frac{1}{4}$, so the lines are perpendicular and $\angle A$ is a right angle.
$AB = AC = \sqrt{17}$, so the triangle is isosceles.

4. $G(5, 0)$

MA.912.GR.3.3

1. a. $\frac{3}{8}$
b. $\sqrt{73}$
c. $\left(1, \frac{11}{2}\right)$

2. $(9, -6)$

3. $x - 2y = 2$

4. $D(6, 2)$

Answers

MA.912.GR.3.4

1. $\sqrt{145}$

2. **a.** 22 in.
   b. 28 in.^{2}

3. **a.** $3\sqrt{13} + \sqrt{65}$ units
   b. 13 units^2

4. **a.** 763 yd
   b. 50,000 yd^2

MA.912.GR.4.1

1. the intersection of a plane and a solid

2. **a.** cylinder
   b. cone
   c. pyramid

3. square

4. triangle

MA.912.GR.4.2

1. the line around which a two-dimensional shape is rotated to form a three-dimensional figure

2. **a.** cylinder
   b. cone
   c. sphere

3. cone with radius 2 cm and height 3 cm

4. sphere with radius 3 in.

MA.912.GR.4.3

1. **a.** a transformation in which a figure is enlarged or reduced with respect to a fixed point
   b. the ratio of the lengths of the corresponding sides of the image and the preimage of a dilation

2. **a.** 8
   b. 54

3. surface area: 117 square inches,
   volume: 81 cubic inches

4. 8 times

MA.912.GR.4.4

1. measure of how many people live in a given area

2. 3614 people per square mile

3. 3150

4. 905 grams

MA.912.GR.4.5

1. **a.** $V = \pi r^2 h$
   b. $V = \frac{1}{3}Bh$
   c. $V = Bh$
   d. $V = \frac{1}{3}\pi r^2 h$
   e. $V = \frac{4}{3}\pi r^3$

2. **a.** 20π cm^3 $\approx$ 62.8 cm^3
   b. 10 cm^3
   c. 120 cm^3
   d. $\frac{20\pi}{3}$ cm^3 $\approx$ 20.9 cm^3
   e. 36π cm^3 $\approx$ 113.04 cm^3

3. 7.2 inches

4. 29,322 pounds

MA.912.GR.4.6

1. **a.** $S = 2\pi r^2 + 2\pi rh$
   b. $S = B + \frac{1}{2}P\ell$
   c. $S = \pi r^2 + \pi r\ell$
   d. $S = 4\pi r^2$

2. **a.** 28π cm^2 $\approx$ 87.96 cm^2
   b. 28 cm^2
   c. 158 cm^2
   d. 16π cm^2 $\approx$ 50.27 cm^3
   e. 36π cm^2 $\approx$ 113.04 cm^2

3. 37.7 square feet

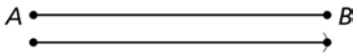
4. 2245 square feet

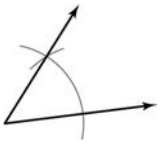
MA.912.GR.5.1

1. copying a line segment

2. C, D, B, A

Answers

3. a. 

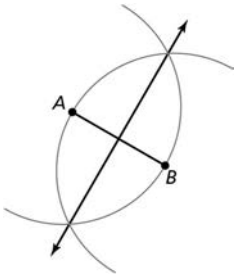
b. 

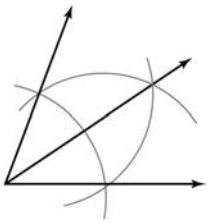
MA.912.GR.5.2

1. a. a ray that divides an angle into two angles that are congruent

b. a point, ray, line, line segment or plane that intersects the segment at its midpoint

2. $\overline{AB} \cong \overline{DB}$, $\overline{DB} \cong \overline{CB}$, and $\overline{AD} \cong \overline{DC}$. Therefore, $\triangle ABD \cong \triangle DBC$ by SSS. $\angle ABD \cong \angle CBD$ because they are corresponding parts of congruent triangles.

3. a. 

b. 

MA.912.GR.5.3

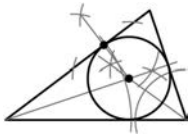
1. a. circle that contains all the vertices of an inscribed polygon

b. a circle tangent to the three sides of a triangle

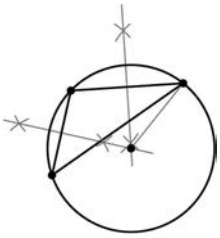
2. a. circumscribed circle

b. inscribed circle

3. a. inscribed circle



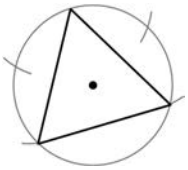
b. circumscribed circle

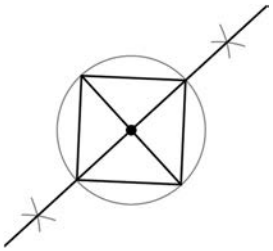


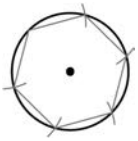
MA.912.GR.5.4

1. $\overline{AC}$ and $\overline{BC}$ are both congruent to the diameter of the circle, so point C is equidistant from points A and B. $\overline{AD}$ and $\overline{BD}$ are both congruent to the diameter of the circle, so point D is equidistant from points A and B. The perpendicular bisector contains all points that are equidistant from the endpoints of a segment, so the line passing through points C and D must be the perpendicular bisector of $\overline{AB}$.

2. C, E, B

3. a. 

b. 

c. 

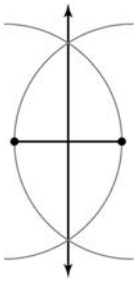
MA.912.GR.5.5

1. a. a line in the plane of a circle that intersects the circle at exactly one point

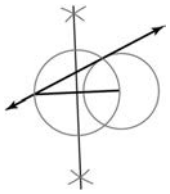
b. a line that is perpendicular to a segment at its midpoint

Answers

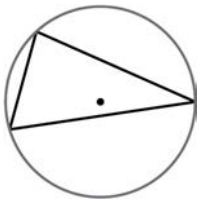
2.



3.



4.



MA.912.GR.6.1

1. a. a line that intersects a circle in two points

b. a line in the plane of a circle that intersects the circle in exactly one point

c. a segment whose endpoints are on a circle

2. a. II

b. III

c. I

3. a. $\frac{25}{2}$; If two chords intersect in the interior of a circle, then the product of the segments of one chord is equal to the product of the segments of the other chord.

b. $\frac{39}{4}$; If two secant segments share the same endpoint outside a circle, then the product of the lengths of one secant segment and its external segment equals the product of the lengths of the other secant segment and its external segment.

4.

STATEMENTS	REASONS
1. $\overline{AB}$ and $\overline{CD}$ are chords of circle O; $\overline{AB} \cong \overline{CD}$	**1.** Given
2. $\overline{OA} \cong \overline{OB} \cong \overline{OC} \cong \overline{OD}$	**2.** Radii of a circle are congruent.
3. $\triangle OAB \cong \triangle OCD$	**3.** SSS Congruence Postulate
4. $\angle AOB \cong \angle COD$	**4.** Congruent parts of congruent angles are congruent.
5. $\overset{\frown}{AB} \cong \overset{\frown}{CD}$	**5.** Arcs of a circle with congruent central angles are congruent.

MA.912.GR.6.2

1. a. a portion of a circle

b. an angle whose vertex is at the center of a circle

c. an angle whose vertex is on a circle and whose sides contain chords of the circle

2. a. III

b. I

c. II

3. 108°

4. 41°

MA.912.GR.6.3

1. a. an angle whose vertex is on the circle and whose sides contain chords of the circle

b. a polygon in which all the vertices lie on the circle

2. a. $x = 41$

b. $y = 56,\ z = 108$

3. $m\angle D = 89°,\ m\angle E = 76°$

4. $m\angle F = 90°,\ m\angle G = 33°,\ \angle H = 57°$

MA.912.GR.6.4

1. a. a portion of the circumference of a circle

b. the region bounded by two radii of the circle and their intercepted arc

2. a. 10π units

b. 25π square units

Answers

3. a. $\frac{5\pi}{3}$ cm

b. 5π cm^2

4. Check students' work.

MA.912.GR.6.5

1. geometric figures that have the same shape but not necessarily the same size

2. Translate $\odot O$ 5 units to the right, then dilate with scale factor $\frac{1}{3}$ and center $(5, 0)$.

3. Translate $\odot O$ so that point O coincides with point P. Dilate $\odot O$ with center at point O and scale factor $\frac{s}{r}$. After the dilation, $\odot O$ will coincide with, demonstrating the circles are similar.

4. Check students' work.

MA.912.GR.7.2

1. $x^2 + y^2 = 49$

2. center $(3, -5)$; radius 9

3. $(x - 2)^2 + (y + 4)^2 = 9$

4. $(x - 5)^2 + (y - 4)^2 = 25$

MA.912.GR.7.3

1. $(x - h)^2 + (y - k)^2 = r^2$

2. center $(-3, 7)$; radius 4

3. $50 \le x \le 450, -300 \le y \le 100$

4. Check students' work.

Trigonometry

MA.912.T.1.1

1. a. hypotenuse

b. opposite

c. adjacent

2. a. cosine

b. tangent

c. sine

3. a. $\sin 30° = \frac{1}{2}$; $\cos 30° = \frac{\sqrt{3}}{2}$; $\tan 30° = \frac{\sqrt{3}}{3}$

b. $\sin P = \frac{3\sqrt{13}}{13}$; $\cos P = \frac{2\sqrt{13}}{13}$; $\tan P = \frac{3}{2}$

4. *Sample answer:* The sine ratio of an acute angle of a right triangle is the ratio of the length of the opposite side to the length of the hypotenuse. The cosine ratio of an acute angle is the ratio of the length of the adjacent side to the length of the hypotenuse. The tangent ratio of an acute angle is the ratio of the opposite side to the length of the adjacent side. The $\sin A = \cos B$, the $\sin B = \cos A$, and $\tan A = \frac{1}{\tan B}$.

MA.912.T.1.2

1. about 31.30 mm

2. x: about 8.03 cm; y: about 11.47 cm; z: about 8.35

3. a. about 20.85 ft

b. about 14.49 ft

MA.912.T.1.3

1. a. 14.4 cm

b. 7 in.

2. a. $b \approx 22.02$; $\angle B \approx 115.55°$; $\angle C \approx 29.45°$

b. $c \approx 7.44$; $\angle A \approx 87.62°$; $\angle C \approx 44.38°$

3. a. Ranger A: about 7.37 mi, Ranger B: about 5.9 mi

b. about 2630 ft

4. *Sample answer:* The Law of Sines is used when two angles and any side or two sides and an angle opposite one of them is given. The Law of Cosines is used when two sides and their included angle or three sides are given. When two sides and an acute angle opposite one of them is given, calculate $b \sin A$ and compare with a. If the result is greater than a there are no triangles. If the result is less than both given sides, there are two triangles.

MA.912.T.1.4

1. a. $9\sqrt{3}$ cm^2

b. 25 in.^{2}

2. a. no

b. yes

c. no

Answers

3. a. about 71.3 in.^{2}

b. about 18.0 cm^2

4. about 765.9 ft^2

Logic and Discrete Theory

MA.912.LT.4.3

1. a. If I ride a bicycle, then I wear a helmet.

b. If I live in Florida, then I live in the United States.

2. a. $p \rightarrow q$

b. $q \rightarrow p$

c. $\sim p \rightarrow \sim q$

d. $\sim q \rightarrow \sim p$

3. a. true; If a quadrilateral is a square, then it is a rectangle.

b. false; If a quadrilateral is a rectangle, then it is a square.

c. false, If a quadrilateral is not a square, then it is not a rectangle.

d. true; If a quadrilateral is not a rectangle, then it is not a square.

MA.912.LT.4.8

1. a. In $\triangle XYZ$, if $\angle X$ is a right angle, then the other angles are not acute.

b. If x is an integer and x^2 is odd, then x is even.

2. *Sample answer:* Make an assumption that is false from the original statement. Try to prove the assumption true until a contradiction occurs. Then the given statement is proven true.

3. *Sample answer:* Assumption: In an isosceles triangle, bases angles are not congruent. The triangle is scalene if the base angles are not congruent. Recall that an isosceles triangle has two congruent sides. The triangle cannot be isosceles if all the sides are different lengths. This contradicts the given statement. Therefore, in an isosceles triangle, base angles are congruent.

MA.912.LT.4.10

1. a. false

b. false

c. true

2. a. *Sample answer:* $10 \times \frac{5}{2} = 25$, which results in a greater number.

b. *Sample answer:* A kite is a quadrilateral with two pairs of congruent sides, but the opposite sides are not parallel, so the kite is not a parallelogram.

3. a. *Sample answer: B* could be on the left side of *A*. For three collinear points, *A*, *B*, and *C* where *B* is between *A* and *C*, then $AB + BC = AC$.

b. *Sample answer:* The exterior angle of a square is 90°. For a regular polygon, the exterior angles are less than 180°.