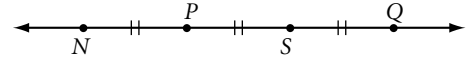


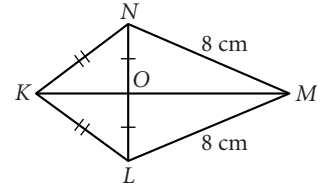
Lesson 1.1 • Building Blocks of Geometry

Name _____ Period _____ Date _____

For Exercises 1–7, complete each statement. $\overline{PS} = 3$ cm.

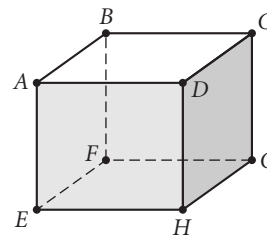


- The midpoint of \overline{PQ} is _____.
- $NQ =$ _____.
- Another name for \overline{NS} is _____.
- S is the _____ of \overrightarrow{SQ} .
- P is the midpoint of _____.
- $\overline{NS} \cong$ _____.
- Another name for \overline{SN} is _____.
- Name all pairs of congruent segments in $KLMN$. Use the congruence symbol to write your answer.
- $M(-4, 8)$ is the midpoint of \overline{DE} . D has coordinates $(6, 1)$. Find the coordinates of E .



For Exercises 10 and 11, use a ruler to draw each figure. Label the figure and mark the congruent parts.

- \overline{AB} and \overline{CD} with M as the midpoint of both \overline{AB} and \overline{CD} . $AB = 6.4$ cm and $CD = 4.0$ cm. A , B , and C are not collinear.
- \overline{AB} and \overline{CD} . C is the midpoint of \overline{AB} , with $AC = 1.5$ cm. D , not on \overline{AB} , is the midpoint of \overline{AE} , with $AD = 2BC$.
- Sketch six points A , B , C , D , E , and F , no three of which are collinear. Name the lines defined by these points. How many lines are there?
- In the figure below, $\{B, C, H, E\}$ is a set of four coplanar points. Name two other sets of four coplanar points. How many sets of four coplanar points are there?

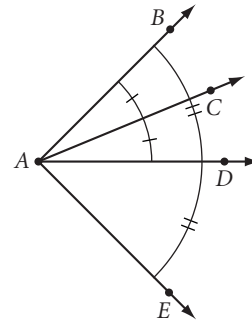


Cube

Lesson 1.2 • Poolroom Math

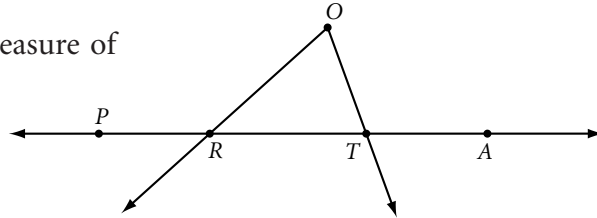
Name _____ Period _____ Date _____

For Exercises 1–5, use the figure at right to complete each statement.



1. A is the _____ of $\angle BAE$.
2. \overrightarrow{AD} is the _____ of $\angle BAE$.
3. \overrightarrow{AD} is a _____ of $\angle DAE$.
4. If $m\angle BAC = 42^\circ$, then $m\angle CAE =$ _____.
5. $\angle DAB \cong$ _____.

For Exercises 6–9, use your protractor to find the measure of each angle to the nearest degree.



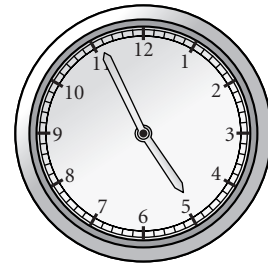
6. $m\angle PRO$
7. $m\angle ORT$
8. $m\angle O$
9. $m\angle RTO$

For Exercises 10–12, use your protractor to draw and then label each angle with the given measure.

10. $m\angle MNO = 15^\circ$
11. $m\angle RIG = 90^\circ$
12. $m\angle z = 160^\circ$

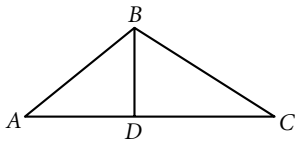
For Exercises 13–15, find the measure of the angle formed by the hands at each time.

13. 3:00
14. 4:00
15. 3:30

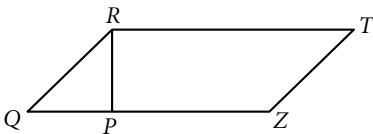


For Exercises 16 and 17, mark each figure with all the given information.

16. $m\angle ADB = 90^\circ$, $AD = BD$, $\angle DAB \cong \angle DBA$



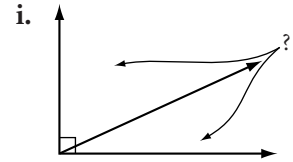
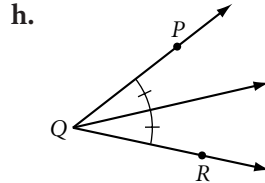
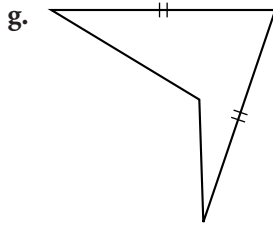
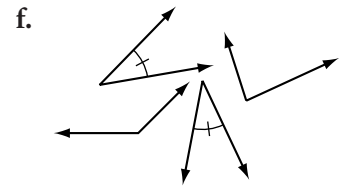
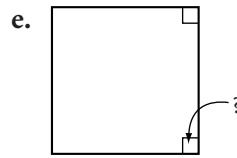
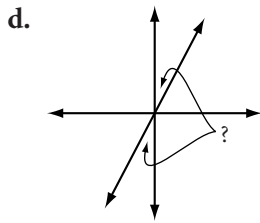
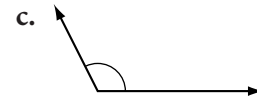
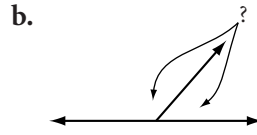
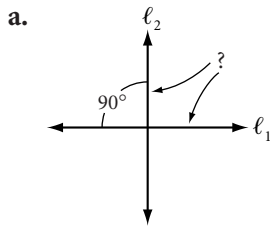
17. $m\angle RPQ = 90^\circ$, $QR = TZ$, $RT = QZ$, $\angle Q \cong \angle T$



Lesson 1.3 • What's a Widget?

Name _____ Period _____ Date _____

For Exercises 1–9, match each term with one of the items (a to i) below.



- | | |
|-----------------------------|--------------------------------|
| 1. _____ Vertical angles | 2. _____ Obtuse angle |
| 3. _____ Right angle | 4. _____ Complementary angles |
| 5. _____ Congruent angles | 6. _____ Linear pair of angles |
| 7. _____ Bisected angle | 8. _____ Perpendicular lines |
| 9. _____ Congruent segments | |
10. If $m\angle P = 13^\circ$, $m\angle Q = 77^\circ$, and $\angle Q$ and $\angle R$ are complementary, what can you conclude about $\angle P$ and $\angle R$? Explain your reasoning.

For Exercises 11–13, sketch, label, and mark a figure showing each property.

11. $\ell_1 \parallel \ell_2, \ell_2 \perp \ell_3$

12. $\overline{PQ} \perp \overline{PR}$

13. $\angle BAC \cong \angle XAY, CX = BC$

Lesson 1.4 • Polygons

Name _____ Period _____ Date _____

For Exercises 1–8, complete the table.

Polygon name	Number of sides	Number of diagonals
1. Triangle		
2.		2
3.	5	
4. Hexagon		
5. Heptagon		
6.	8	
7.		35
8.	12	

For Exercises 9 and 10, sketch and label each figure. Mark the congruences.

9. Concave pentagon *PENTA*, with external diagonal \overline{ET} , and $\overline{TA} \cong \overline{PE}$.
10. Equilateral quadrilateral *QUAD*, with $\angle Q \cong \angle U$.

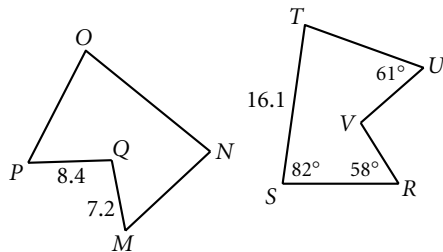
For Exercises 11–14, sketch and use hexagon *ABCDEF*.

- Name the diagonals from *A*.
- Name a pair of consecutive sides.
- Name a pair of consecutive angles.
- Name a pair of non-intersecting diagonals.

For Exercises 15–18, use the figures at right.

$$MNOPQ \cong RSTUV$$

- $m\angle N = \underline{\hspace{2cm}}$
- $VR = \underline{\hspace{2cm}}$
- $m\angle P = \underline{\hspace{2cm}}$
- $ON = \underline{\hspace{2cm}}$



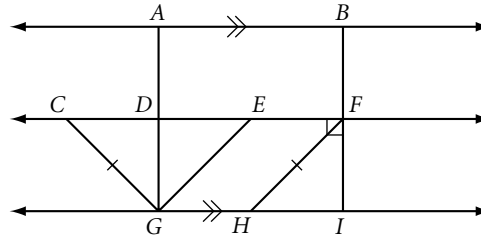
- The perimeter of a regular pentagon is 31 cm. Find the length of each side.

Lesson 1.5 • Triangles

Name _____ Period _____ Date _____

For Exercises 1–5, use the figure at right. Name a pair of

1. Parallel segments
2. Perpendicular segments
3. Congruent segments
4. Supplementary angles
5. Linear angles



For Exercises 6 and 7, sketch, label, and mark each figure.

6. Isosceles obtuse triangle TRI with vertex angle T .

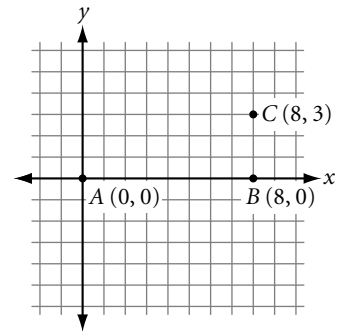
7. Scalene right triangle SCA with midpoints L , M , and N on \overline{SC} , \overline{CA} , and \overline{SA} , respectively.

For Exercises 8 and 9, use your geometry tools to draw each figure.

8. Acute isosceles triangle ACD with vertex angle A measuring 40° .
9. Scalene right triangle RGH .

For Exercises 10–12, use the graph at right.

10. Locate F so that $\triangle ABF$ is a right triangle.
11. Locate D so that $\triangle ABD$ is an isosceles triangle.
12. Locate G so that $\triangle ABG$ is scalene and not a right triangle.



Lesson 1.6 • Special Quadrilaterals

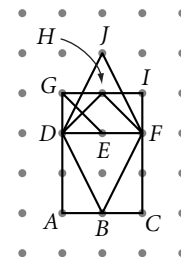
Name _____ Period _____ Date _____

For Exercises 1–6, sketch, label, and mark each figure.

1. Parallelogram $PGRA$
2. Square $SQRE$
3. Rhombus $RHOM$ with acute $\angle H$.
4. Trapezoid $TRAP$ with $\overline{TR} \parallel \overline{AP}$, $\overline{RE} \perp \overline{PA}$, and $P, E,$ and A collinear.
5. Kite $KITE$ with $EK = KI$ and obtuse $\angle K$.
6. Rectangle $RANG$ with perimeter $2a + 4b$

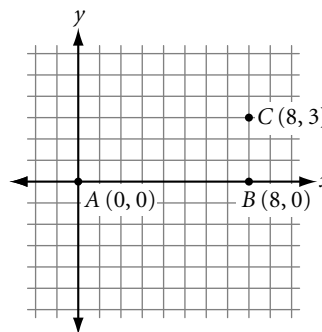
For Exercises 7–10, name each polygon in the figure. Assume that the grid is square.

7. Square
8. Parallelogram
9. Rhombus
10. Kite



For Exercises 11–13, use the graph at right.

11. Locate D so that $ABCD$ is a rectangle.
12. Locate E so that $ABCE$ is a trapezoid.
13. Locate G so that points $A, B, C,$ and G determine a parallelogram that is not a rectangle.

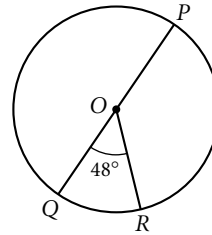


Lesson 1.7 • Circles

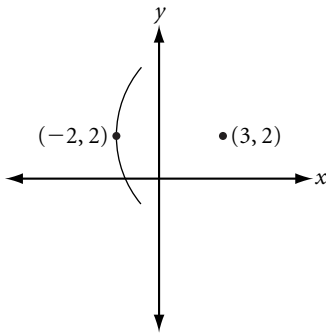
Name _____ Period _____ Date _____

For Exercises 1–4, use the figure at right.

1. $m\widehat{QR} =$ _____ 2. $m\widehat{PR} =$ _____
 3. $m\widehat{PQR} =$ _____ 4. $m\widehat{QPR} =$ _____



5. Sketch a circle with an inscribed pentagon.
6. Sketch a circle with a circumscribed quadrilateral.
7. A circle with center $(3, 2)$ goes through $(-2, 2)$. Give the coordinates of three other points on the circle.
8. Use a compass, protractor, and straightedge to draw circle O with diameter \overline{AB} ; radius \overline{OC} with $\overline{OC} \perp \overline{AB}$; \overline{OD} , the angle bisector of $\angle AOC$, with D on the circle; chords \overline{AC} and \overline{BC} ; and a tangent at D .



9. Use a compass to construct a circle. Label the center P . Sketch two parallel tangents. Connect the points of tangency. What do you notice about the chord?
10. Use your compass and protractor to make an arc with measure 50° , an arc with measure 180° , and an arc with measure 290° . Label each arc with its measure.
11. Use your compass to construct two circles with different radii that intersect in two points. Label the centers P and Q and the points of intersection A and B . Construct quadrilateral $PAQB$. What type of quadrilateral is it?

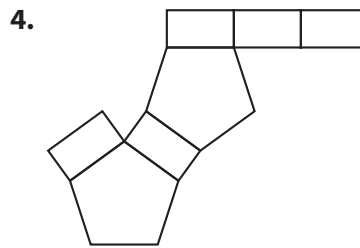
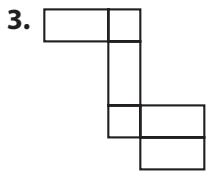
Lesson 1.8 • Space Geometry

Name _____ Period _____ Date _____

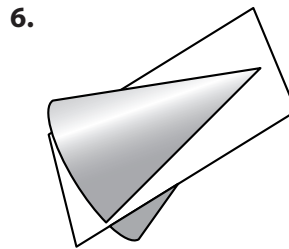
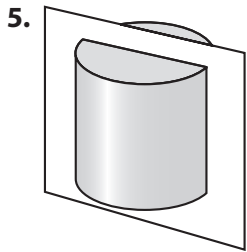
For Exercises 1 and 2, draw each figure.

1. A prism with a rectangular base.
2. A cylinder with base diameter greater than height.

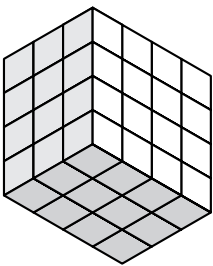
For Exercises 3 and 4, sketch the three-dimensional figure formed by folding each net into a solid. Name the solid.



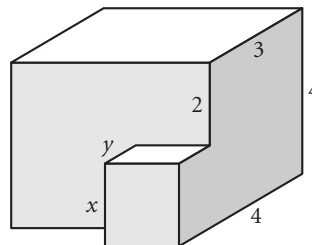
For Exercises 5 and 6, sketch the section formed when each solid is sliced by the plane as shown.



7. The prism below is built with 1-cm cubes. How many cubes are completely hidden from sight, as seen from this angle?



8. Find the lengths of x and y .



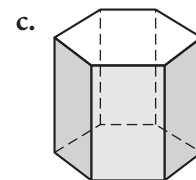
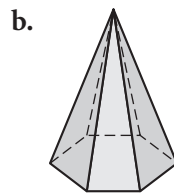
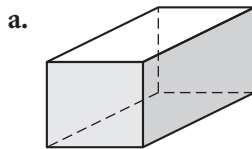
Lesson 1.9 • A Picture Is Worth a Thousand Words

Name _____ Period _____ Date _____

Read and reread each problem carefully, determining what information you are given and what it is that you trying to find.

1. A pair of parallel interstate gas and power lines run 10 meters apart and are equally distant from relay station *A*. The power company needs to locate a gas-monitoring point on one of the lines exactly 12 meters from relay station *A*. Draw a diagram showing the locus of possible locations.
2. The six members of the Senica High School math club are having a group photo taken for the yearbook. The photographer has asked the club to submit the height of each member so that he can quickly arrange them in order. The math club sent him the following information. Anica is 4 inches taller than Bruce. Charles is the same height as Ellen but an inch taller than Anica. Fred is midway between Bruce and Dora. Dora is 2 inches taller than Anica. Help out the photographer by arranging the club members in order from tallest to shortest.
3. Create a Venn diagram showing the relationships among triangles, acute triangles, isosceles triangles, and scalene triangles.

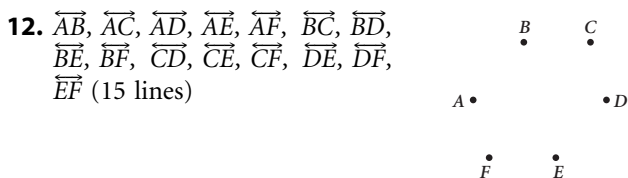
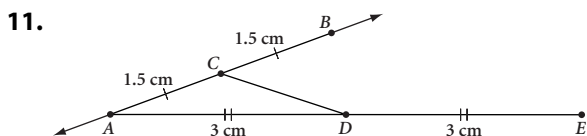
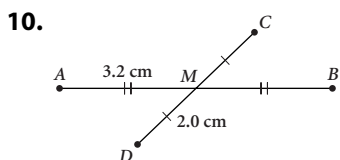
4. Sketch a possible net for each solid.



ANSWERS

LESSON 1.1 • Building Blocks of Geometry

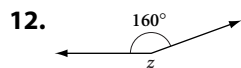
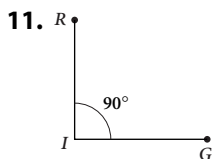
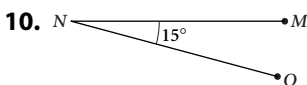
1. S 2. 9 cm 3. \overline{SN} 4. endpoint
 5. \overline{NS} 6. \overline{PQ} 7. \overline{SP}
 8. $\overline{KN} \cong \overline{KL}$, $\overline{NM} \cong \overline{LM}$, $\overline{NO} \cong \overline{LO}$
 9. $E(-14, 15)$



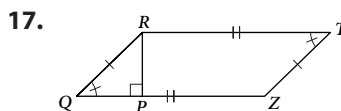
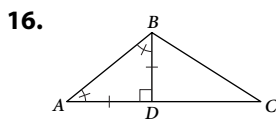
13. Possible coplanar set: $\{C, D, H, G\}$; 12 different sets

LESSON 1.2 • Poolroom Math

1. vertex 2. bisector 3. side
 4. 126° 5. $\angle DAE$ 6. 133°
 7. 47° 8. 63° 9. 70°



13. 90° 14. 120° 15. 75°

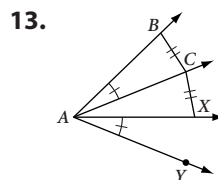
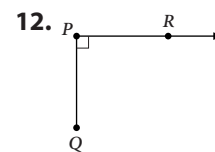
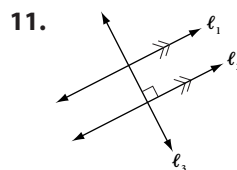


LESSON 1.3 • What's a Widget?

1. d 2. c 3. e 4. i
 5. f 6. b 7. h 8. a

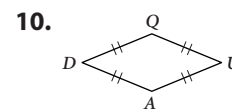
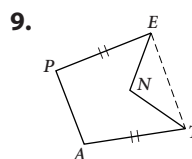
9. g

10. They have the same measure, 13° . Because $m\angle Q = 77^\circ$, its complement has measure 13° . So $m\angle R = 13^\circ$, which is the same as $m\angle P$.



LESSON 1.4 • Polygons

Polygon name	Number of sides	Number of diagonals
1. Triangle	3	0
2. Quadrilateral	4	2
3. Pentagon	5	5
4. Hexagon	6	9
5. Heptagon	7	14
6. Octagon	8	20
7. Decagon	10	35
8. Dodecagon	12	54



11. $\overline{AC}, \overline{AD}, \overline{AE}$

12. Possible answer: \overline{AB} and \overline{BC}

13. Possible answer: $\angle A$ and $\angle B$

14. Possible answer: \overline{AC} and \overline{FD}

15. 82° 16. 7.2 17. 61° 18. 16.1

19. 6.2 cm

LESSON 1.5 • Triangles

For Exercises 1–7, answers will vary. Possible answers are shown.

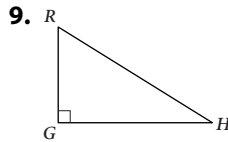
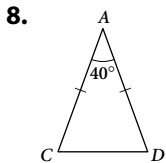
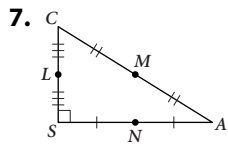
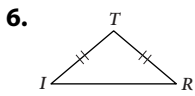
1. $\overline{AB} \parallel \overline{GH}$

2. $\overline{EF} \perp \overline{BI}$

3. $\overline{CG} \cong \overline{FH}$

4. $\angle DEG$ and $\angle GEF$

5. $\angle DEG$ and $\angle GEF$



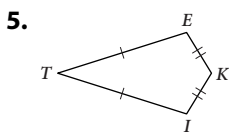
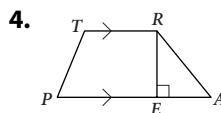
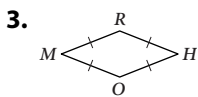
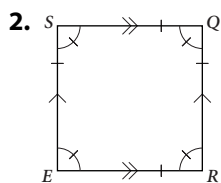
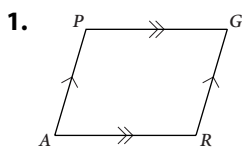
For Exercises 10–12, answers may vary. Possible answers are shown.

10. $F(8, -2)$

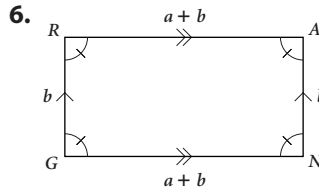
11. $D(4, 3)$

12. $G(10, -2)$

LESSON 1.6 • Special Quadrilaterals



For Exercises 6–10, 12, and 13, answers may vary. Possible answers are shown.

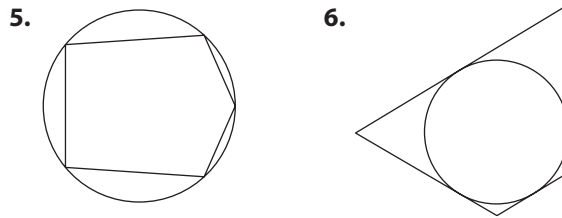


7. $ACFD$ 8. $EFHG$ 9. $BFJD$ 10. $BFHD$

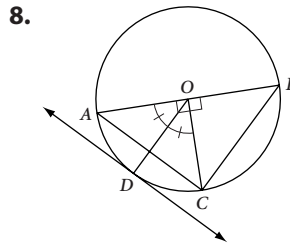
11. $D(0, 3)$ 12. $E(0, 5)$ 13. $G(16, 3)$

LESSON 1.7 • Circles

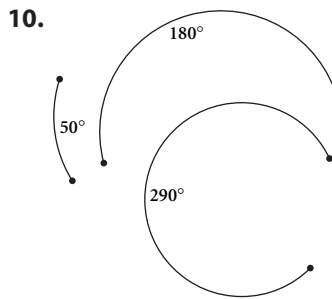
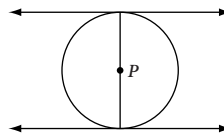
1. 48° 2. 132° 3. 228° 4. 312°



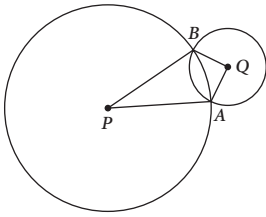
7. $(8, 2); (3, 7); (3, -3)$



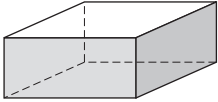
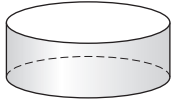
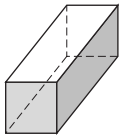
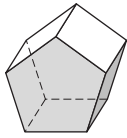
9. The chord goes through the center, P . (It is a diameter.)



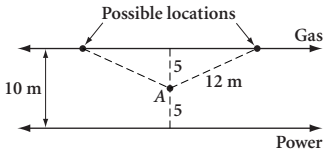
11. Kite

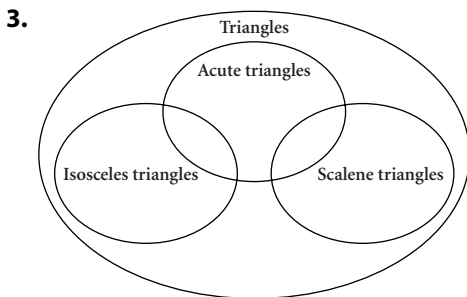
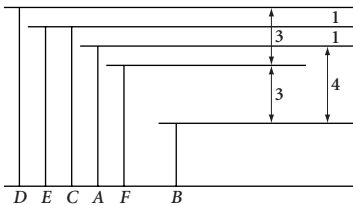


LESSON 1.8 • Space Geometry

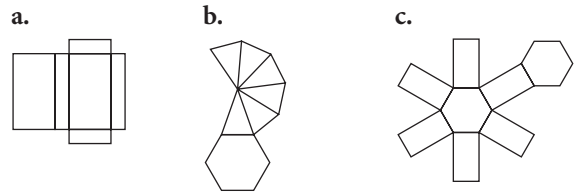
1. 
2. 
3. Rectangular prism
4. Pentagonal prism
5. 
6. 
7. 18 cubes
8. $x = 2, y = 1$

LESSON 1.9 • A Picture Is Worth a Thousand Words

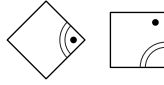
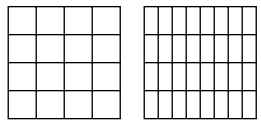
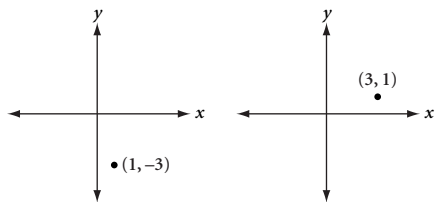
1. 
2. Dora, Ellen, Charles, Anica, Fred, Bruce



4. Possible answers:



LESSON 2.1 • Inductive Reasoning

1. 20, 24
2. $12\frac{1}{2}, 6\frac{1}{4}$
3. $\frac{5}{4}, 2$
4. -1, -1
5. 72, 60
6. 243, 729
7. 91, 140
8. 
9. 
10. 

11. False; $(\frac{1}{2})^2 = \frac{1}{4}$
12. False; $11 \cdot 10 = 110, 11 \cdot 12 = 132$
13. True

LESSON 2.2 • Finding the n th Term

1. Linear
2. Linear
3. Not linear
4. Linear
5.

n	1	2	3	4	5
$f(n)$	-5	2	9	16	23
6.

n	1	2	3	4	5
$g(n)$	-10	-18	-26	-34	-42
7. $f(n) = 4n + 5; f(50) = 205$
8. $f(n) = -5n + 11; f(50) = -239$
9. $f(n) = \frac{1}{2}n + 6; f(50) = 31$

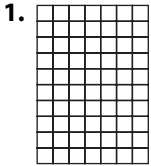
10.

n	1	2	3	4	5	...	n	...	50
Number of triangles	1	5	9	13	17	...	$4n - 3$...	197

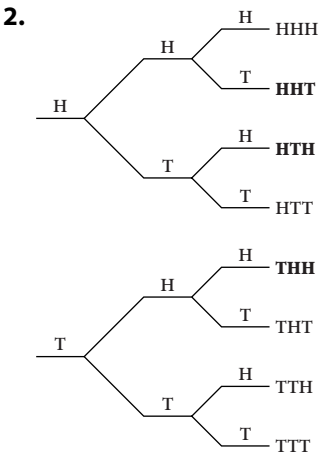
11.

n	1	2	3	4	5	...	n	...	50
Area of figure	1	4	16	64	256	...	4^{n-1}	...	4^{49}

LESSON 2.3 • Mathematical Modeling

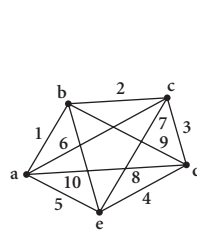


- a. 240
- b. 1350
- c. $f(n) = 2n(n + 2)$, or $f(n) = 2n^2 + 4n$

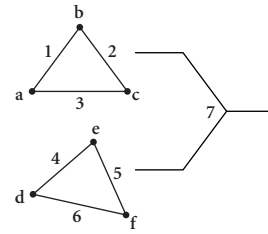


- a. 8 sequences
 - b. 3 sequences have 1 tail.
 - c. $\frac{3}{8}$
3. 66 different pairs. Use a dodecagon showing sides and diagonals.

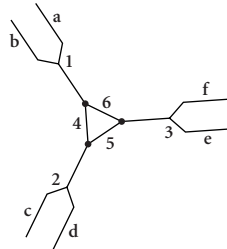
4. Answers will vary. Possible answers:



5 teams, 10 games



6 teams, 7 games



6 teams, 6 games

LESSON 2.4 • Deductive Reasoning

- 1. No. Explanations will vary. Sample explanation: Because $\triangle ABC$ is equilateral, $AB = BC$. Because C lies between B and D , $BD > BC$, so BD is not equal to AB . Thus $\triangle ABD$ is not equilateral, by deductive reasoning.
- 2. Answers will vary. $m\angle E > m\angle D$ ($m\angle E = m\angle D + 90^\circ$); deductive
- 3. a, e, f; inductive
- 4. Deductive
 - a. $4x + 3(2 - x) = 8 - 2x$ The original equation.
 - $4x + 6 - 3x = 8 - 2x$ Distributive property.
 - $x + 6 = 8 - 2x$ Combining like terms.
 - $3x + 6 = 8$ Addition property of equality.
 - $3x = 2$ Subtraction property of equality.
 - $x = \frac{2}{3}$ Division property of equality.