

My academic goal for this unit is...

Check for Understanding Key:

- Understanding at start of the unit
- | Understanding after practice
- ▲ Understanding before unit test

LEARNING TARGETS	How is my understanding?	Test Score	Retake?
1f I can name and classify any polygon (3-12 & n-sides).	_____ 1 2 3 4		
1g I can name and classify triangles and quadrilaterals.	_____ 1 2 3 4		
1h I can identify triangles by type.	_____ 1 2 3 4		
1i I can identify quadrilaterals by type.	_____ 1 2 3 4		

Where does the word “polygon” come from?

What is a REGULAR polygon?

What went well from the last unit?

What study skill can you improve on in this unit?

1 Just starting, Insufficient	2 Yes, but..., Minimal	3 Yes, Proficient	4 WOW, Excellent
I can't do it and am not able to explain process or key points	I can sort of do it and am able to show process, but not able to identify/explain key math points	I can do it and able to both explain process and identify/explain math points	I'm great at doing it and am able to explain key math points accurately in a variety of problems

Unit 1B Definitions

<i>Term</i>	<i>Definition</i>	<i>Diagram</i>																						
Polygon																								
Naming Polygons	<table><tr><th>Sides</th><th>Name</th></tr><tr><td>3</td><td>Triangle</td></tr><tr><td>4</td><td></td></tr><tr><td>5</td><td></td></tr><tr><td>6</td><td></td></tr><tr><td>7</td><td></td></tr><tr><td>9</td><td></td></tr><tr><td>10</td><td></td></tr><tr><td>11</td><td></td></tr><tr><td>12</td><td></td></tr><tr><td>n</td><td></td></tr></table>	Sides	Name	3	Triangle	4		5		6		7		9		10		11		12		n		
Sides	Name																							
3	Triangle																							
4																								
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11																								
12																								
n																								
Diagonal																								
Convex																								
Concave																								
Congruent Polygons																								
Equilateral																								

<i>Term</i>	<i>Definition</i>	<i>Diagram</i>
Equiangular		
Regular		
Triangle Definitions		
Right Triangle		
Acute Triangle		
Obtuse Triangle		
Scalene Triangle		
Equilateral Triangle		
Isosceles Triangle		

<i>Term</i>	<i>Definition</i>	<i>Diagram</i>
Quadrilateral Definitions		
Trapezoid		
Isosceles Trapezoid		
Kite		
Parallelogram		
Rhombus		
Rectangle		
Square		

NOTES

NOTES

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 $\angle Q \not\cong \angle U$.

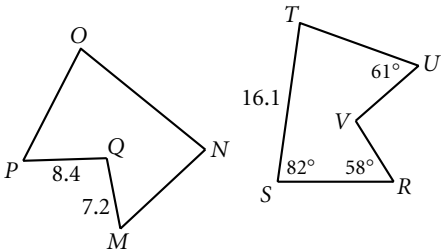
For Exercises 11–14, sketch and use hexagon *ABCDEF*.

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

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

$MNOPQ \cong RSTUV$

15. $m\angle N =$ _____
16. $VR =$ _____
17. $m\angle P =$ _____
18. $ON =$ _____

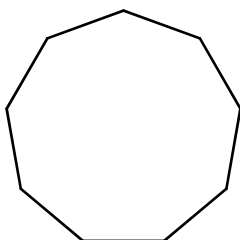


19. The perimeter of a regular pentagon is 31 cm. Find the length of each side.

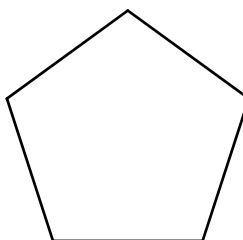
Practice: Polygons

Write the name of each polygon.

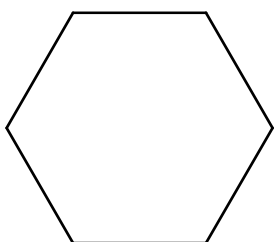
1)



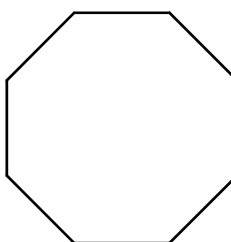
2)



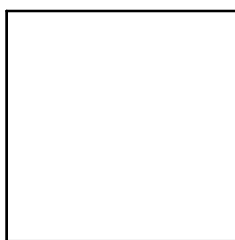
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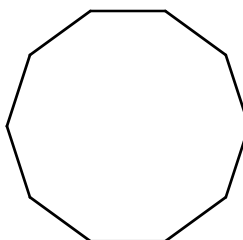
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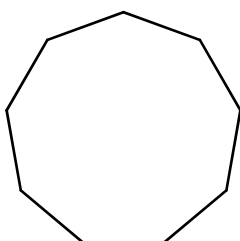
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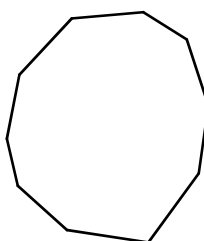
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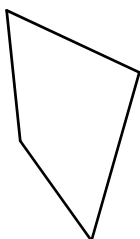
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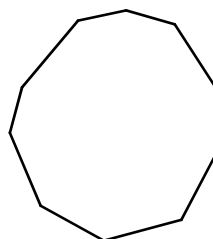
8)



9)

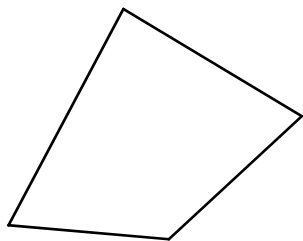


10)

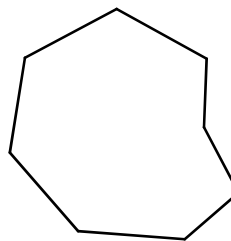


State if each polygon is concave or convex.

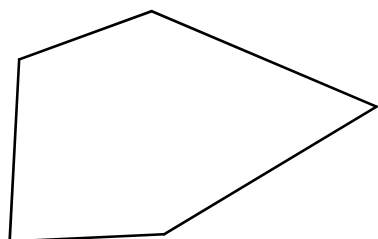
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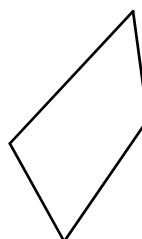
12)



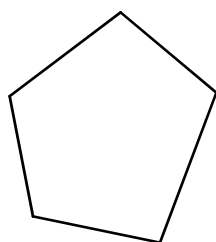
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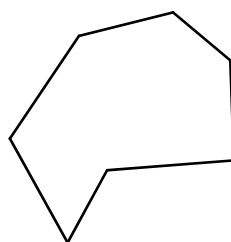
14)



15)

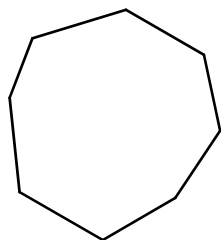


16)

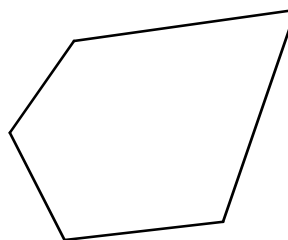


State if each polygon is regular or not.

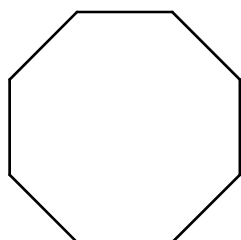
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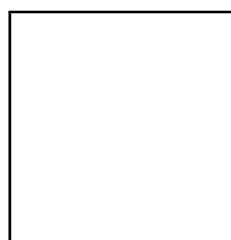
18)



19)



20)

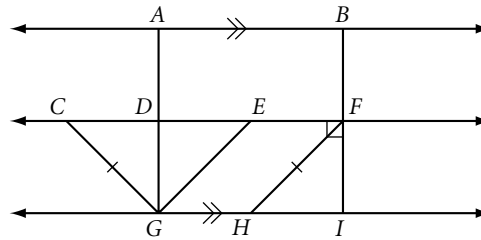


Lesson 1.5 • Triangles

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.

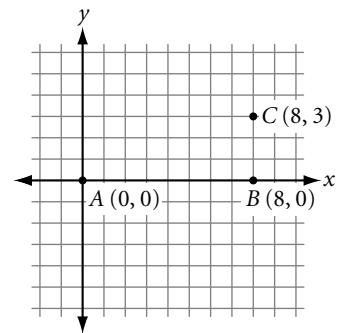
6. Isosceles obtuse triangle TRI with vertex angle T .
7. Scalene right triangle SCA with midpoints L , M , and N on $\overline{SC}$, $\overline{CA}$, and $\overline{SA}$, respectively.

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

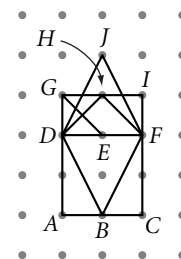
Name _____ Period _____ Date _____

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 $2a + 4b$

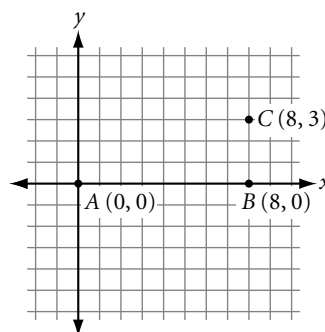
For Exercises 7–10, name each polygon in the figure. Assume that the grid is square.

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



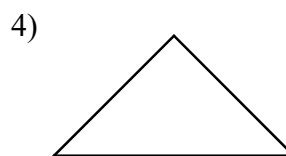
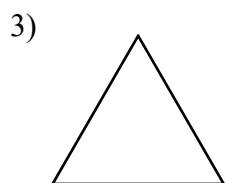
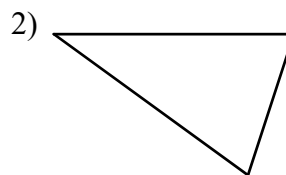
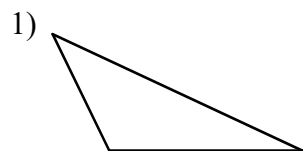
For Exercises 11–13, use the graph at right.

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.

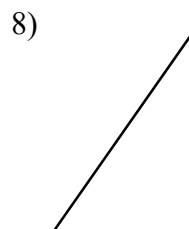
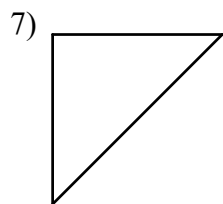
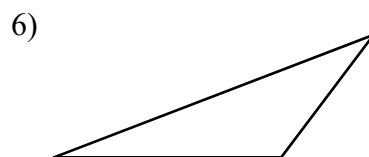
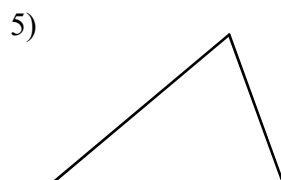


Practice: Traingles & Quadrilaterals

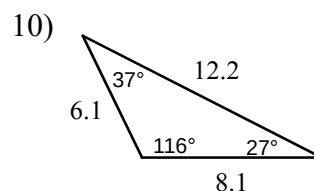
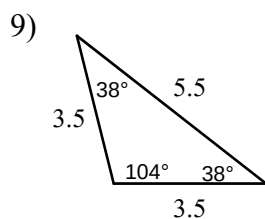
Classify each triangle by its sides. Base your decision on the actual lengths of the sides and the measures of the angles.



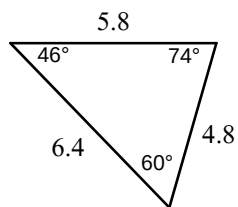
Classify each triangle by its angles.



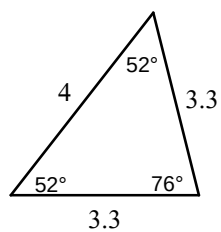
Classify each triangle by its angles and sides.



11)

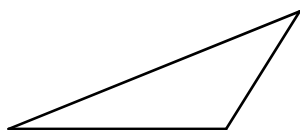


12)

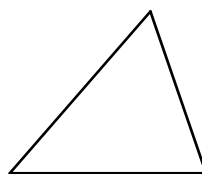


Classify each triangle by its angles and sides. Equal sides and equal angles, if any, are indicated in each diagram.

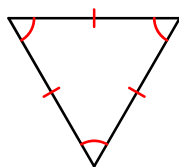
13)



14)



15)



16)

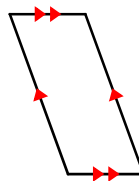


State the most specific name for each figure.

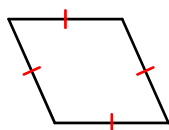
17)



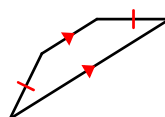
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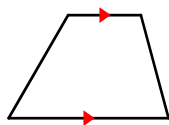
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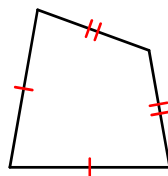
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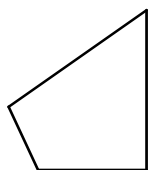
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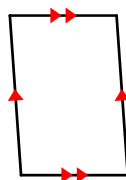
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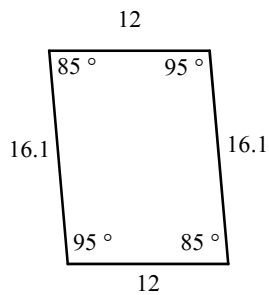
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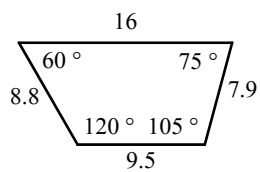
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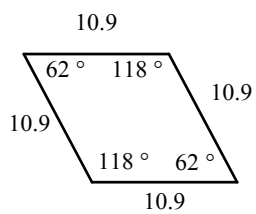
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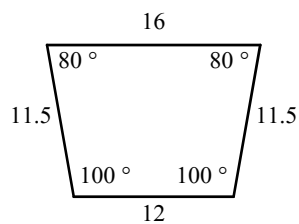
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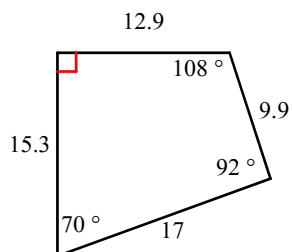
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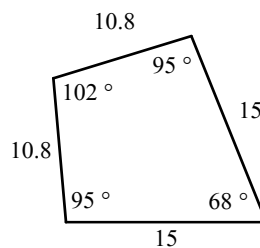
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29)



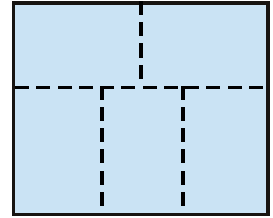
30)



Chapter 1B • Challenge Problems

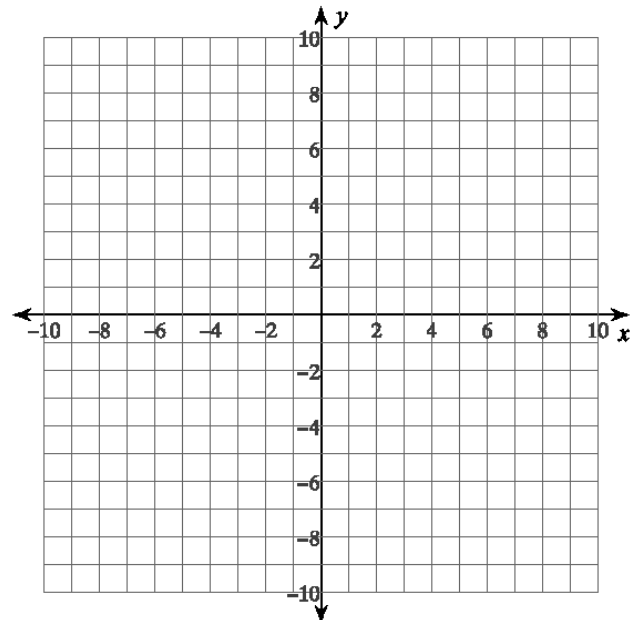
1. (*Target 1f*)

A rectangle with perimeter 198 cm is divided into five congruent rectangles as shown in the diagram at the right. What is the perimeter of one of the five congruent rectangles?



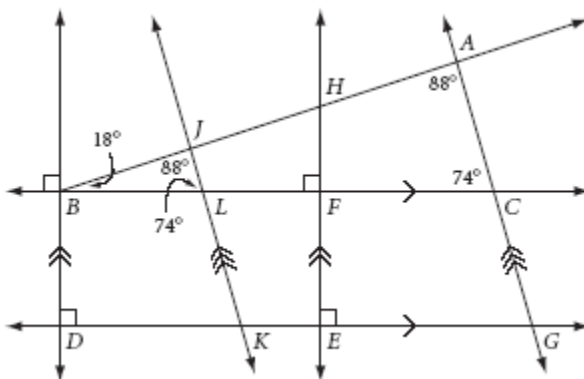
2. (*Target 1f*)

Draw an equilateral octagon $ABCDEFGH$ with $A(5,0)$, $B(4,4)$, and $C(0,5)$ as three of its vertices. Is it regular?

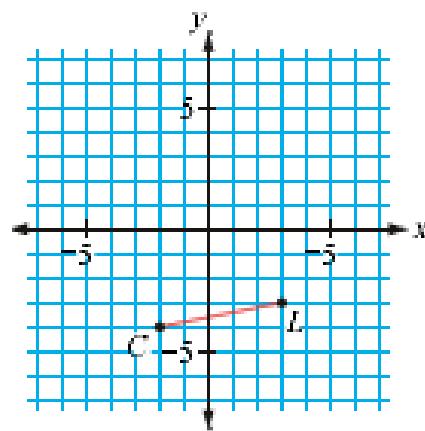
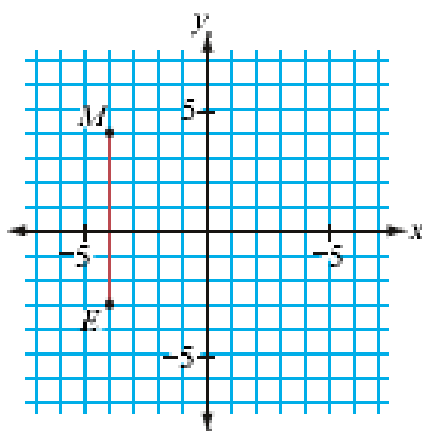
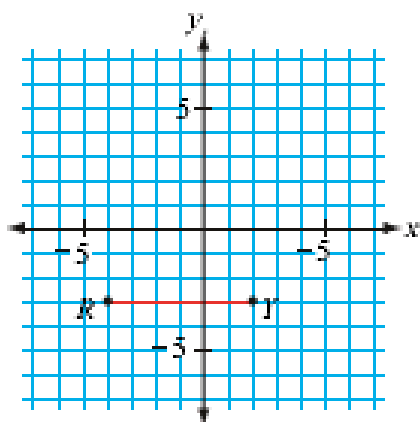


- ### 3. (Targets 1h & 1i)

Identify as many different types of triangles and different types of quadrilaterals in the figure below. Identify each figure by its type and its name (for example, “acute triangle XYZ ,” “parallelogram $PQRS$ ”). Explain how you know each figure satisfies the definition for its particular type. For example, if you identify a figure as a parallelogram, explain how you *know* it is a parallelogram.



For questions 4-6, use the graphs below. Can you find more than one answer? (*Target 1g*)



4. Locate a point L so that $\triangle LRY$ is an isosceles triangle.
5. Locate a point O so that $\triangle MOE$ is an isosceles right triangle.
6. Locate a point R so that $\triangle CRL$ is an isosceles right triangle.

7. (*Target 1h*)

Polyominoes

In 1953, United State mathematician Solomon Golomb introduced polyominoes at the Harvard Mathematics Club, and they have been played with and enjoyed throughout the world ever since. Polyominoes are shapes made by connecting congruent squares. The squares are joined together side to side. (A complete side must touch a complete side.) Some of the smaller polyominoes are shown below. There is only one monomino and only one domino, but there are two trominoes, as shown. There are five tetrominoes—one is shown. Sketch the other four.



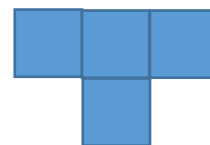
Monomino



Domino



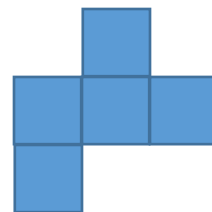
Trominoes



Tetromino

Sketches:

There are also 12 pentominoes. Can you find them all? One is shown at the right. Use graph paper or square dot paper to sketch all 12.



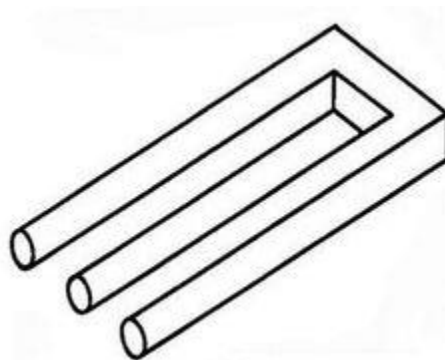
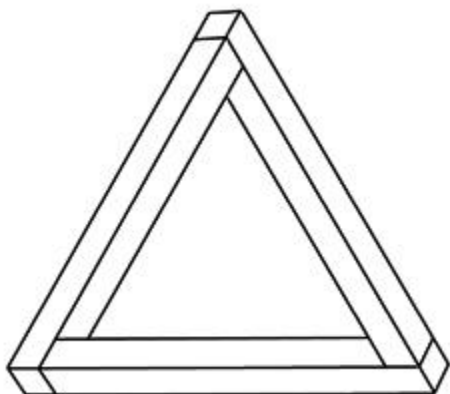
8. (Target 1h & 1i)

A large aluminum ladder was resting vertically against the research shed at midnight when it began to slide down the side of the shed. A burglar was clinging to the ladder's midpoint, holding a pencil flashlight was visible in the dark. Witness Jill Seymour claimed to see the ladder slide. What did she see? That is, what was the path taken by the bulb of the flashlight? Draw a diagram showing the path. (Devise a physical test to check your visual thinking. You might try sliding a meterstick against a wall, or you might plot points on graph paper.)



9. (Target 1h & 1i)

You experienced some optical illusions with op art in Chapter 0. Some optical illusions are tricks—they at first appear to be drawings of real objects, but actually they are impossible to make, except on paper. Reproduce the two impossible objects by drawing them on full sheets of paper.

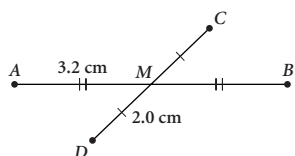


ANSWERS

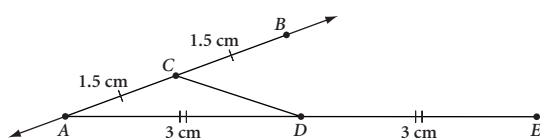
LESSON 1.1 • Building Blocks of Geometry

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. $E(-14, 15)$

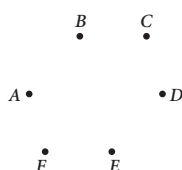
10.



11.



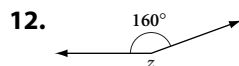
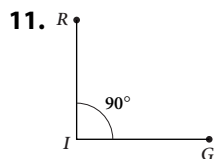
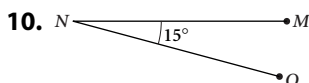
12. $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{AE}$, $\overline{AF}$, $\overline{BC}$, $\overline{BD}$,
 $\overline{BE}$, $\overline{BF}$, $\overline{CD}$, $\overline{CE}$, $\overline{CF}$, $\overline{DE}$, $\overline{DF}$,
 $\overline{EF}$ (15 lines)



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

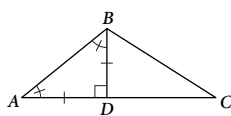
LESSON 1.2 • Poolroom Math

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

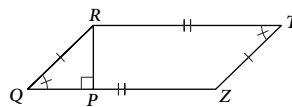


13. 90° 14. 120° 15. 75°

16.



17.

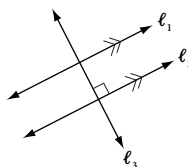


LESSON 1.3 • What's a Widget?

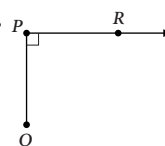
1. d 2. c 3. e 4. i
 5. f 6. b 7. h 8. a
 9. g

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 $m\angle P$.

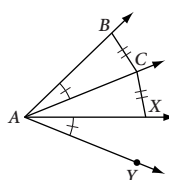
11.



12.



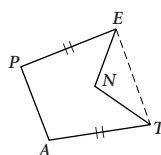
13.



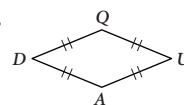
LESSON 1.4 • Polygons

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

9.



10.



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

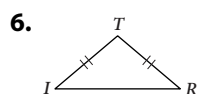
LESSON 1.5 • Triangles

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

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

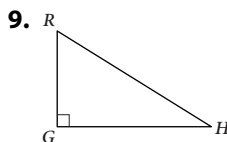
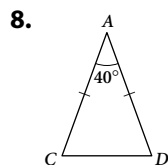
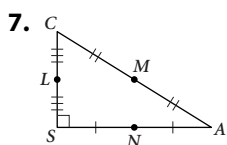
3. $\overline{CG} \cong \overline{FH}$

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



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

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



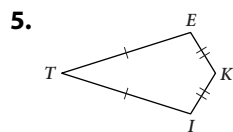
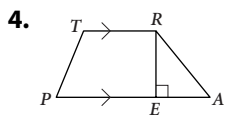
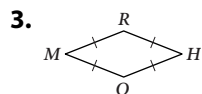
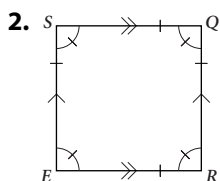
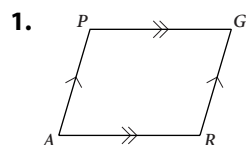
For Exercises 10–12, answers may vary. Possible answers are shown.

10. $F(8, -2)$

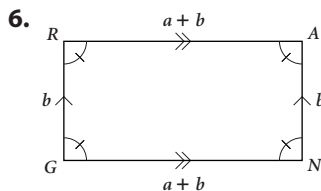
11. $D(4, 3)$

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. $G(16, 3)$

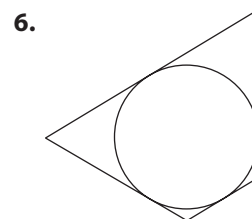
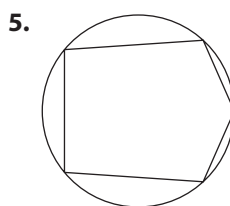
LESSON 1.7 • Circles

1. 48°

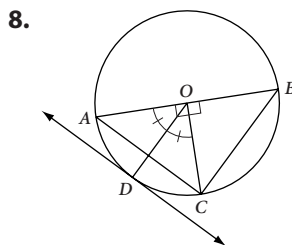
2. 132°

3. 228°

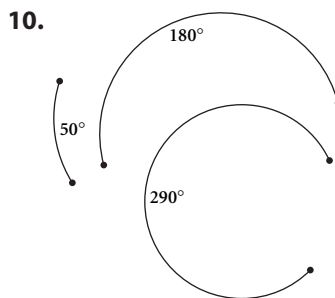
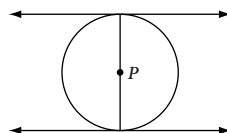
4. 312°



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



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



Answers to Practice: Polygons

- | | | | |
|------------------|-----------------|-------------|-------------|
| 1) nonagon | 2) pentagon | 3) hexagon | 4) octagon |
| 5) quadrilateral | 6) decagon | 7) nonagon | 8) decagon |
| 9) quadrilateral | 10) decagon | 11) convex | 12) concave |
| 13) convex | 14) convex | 15) convex | 16) concave |
| 17) not regular | 18) not regular | 19) regular | 20) regular |

Answers to Practice: Traingles & Quadrilaterals

- | | | | |
|---------------------|--------------------|-------------------|-------------------------|
| 1) scalene | 2) isosceles | 3) equilateral | 4) isosceles |
| 5) acute | 6) obtuse | 7) right | 8) right |
| 9) obtuse isosceles | 10) obtuse scalene | 11) acute scalene | 12) acute isosceles |
| 13) obtuse scalene | 14) acute scalene | 15) equilateral | 16) right scalene |
| 17) rectangle | 18) parallelogram | 19) rhombus | 20) isosceles trapezoid |
| 21) trapezoid | 22) kite | 23) quadrilateral | 24) parallelogram |
| 25) parallelogram | 26) trapezoid | 27) rhombus | 28) isosceles trapezoid |
| 29) quadrilateral | 30) kite | | |