

NAME \_\_\_\_\_

DATE \_\_\_\_\_

A B C D E F

G H I J K L M

N O P Q R S

T U V W X Y

Z

Name \_\_\_\_\_

Figure	$\angle 1$	$\angle 2$	$\angle 3$	$\angle 4$	$\angle 5$	$\angle 6$	$\angle 7$	$\angle 8$

NAME \_\_\_\_\_

DATE \_\_\_\_\_

Triangle	Degrees in angle 1	Degrees in angle 2	Degrees in angle 3	Sum of the angles
A				
B				
C				
D				
E				
F				

**TYPE OF TRIANGLE**

**A** \_\_\_\_\_

**B** \_\_\_\_\_

**C** \_\_\_\_\_

**D** \_\_\_\_\_

**E** \_\_\_\_\_

**F** \_\_\_\_\_

	Degrees in angle 1	Degrees in angle 2	Degrees in angle 3	Degrees in angle 4	Sum of the angles
<b>A</b>					
<b>B</b>					
<b>C</b>					
<b>D</b>					
<b>E</b>					
<b>F</b>					

**TYPE OF QUADRILATERAL**

**A** \_\_\_\_\_

**B** \_\_\_\_\_

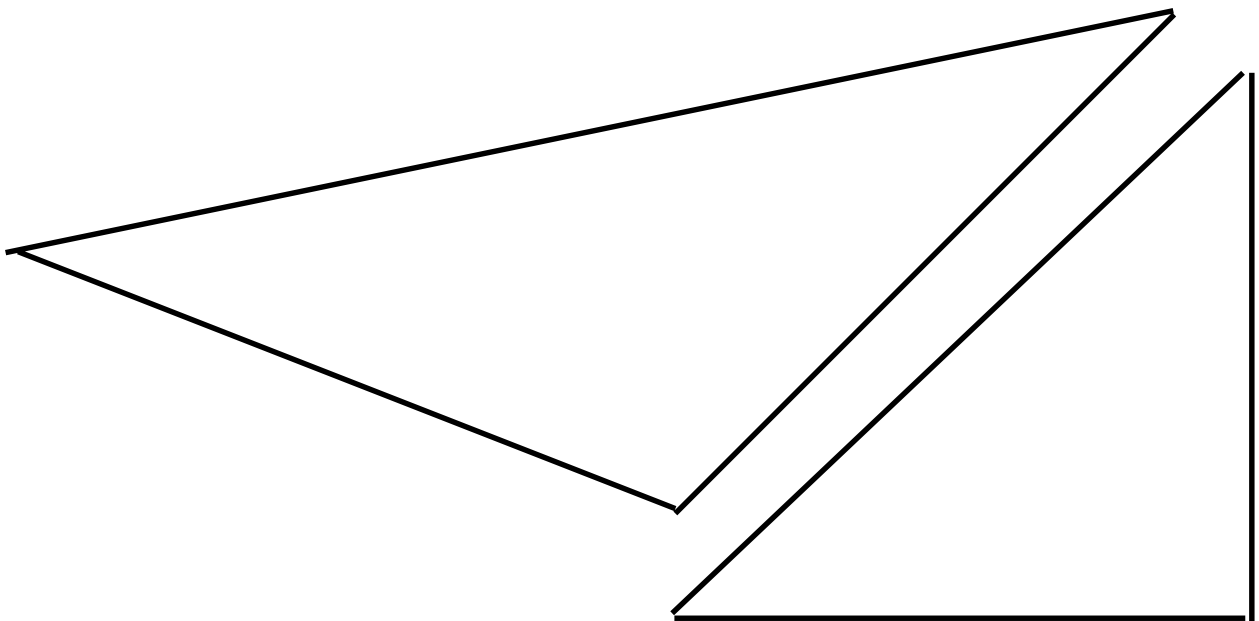
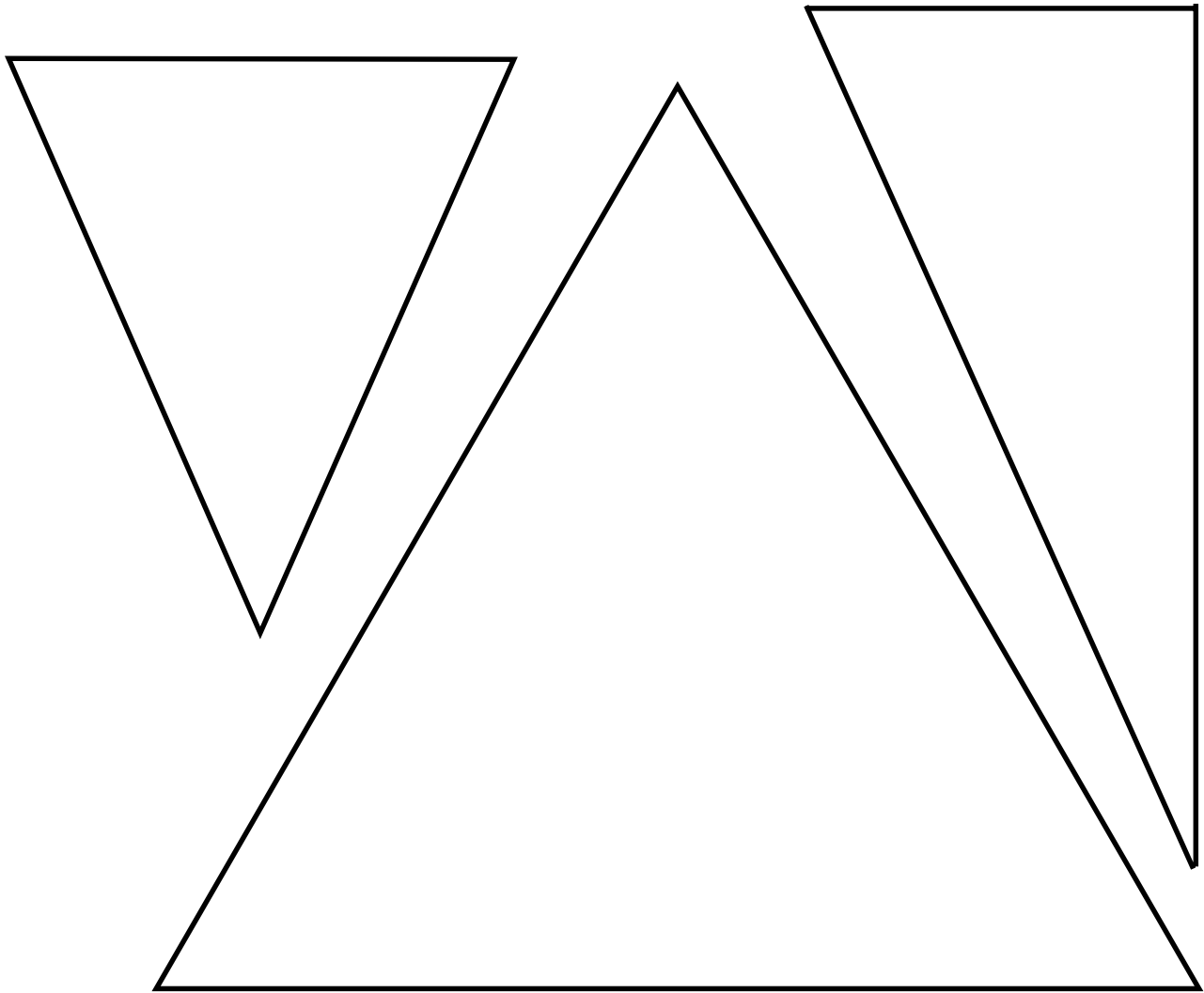
**C** \_\_\_\_\_

**D** \_\_\_\_\_

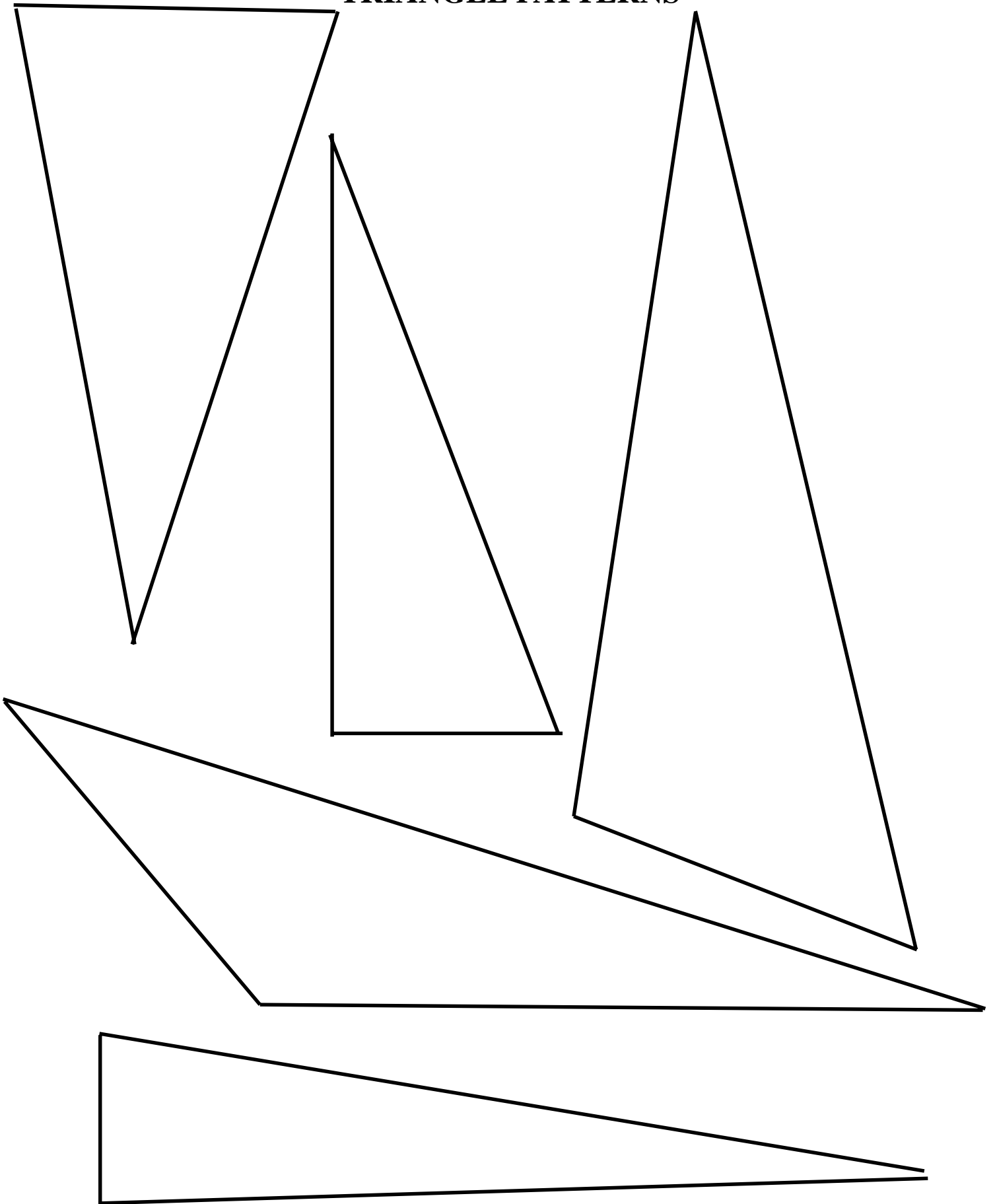
**E** \_\_\_\_\_

**F** \_\_\_\_\_

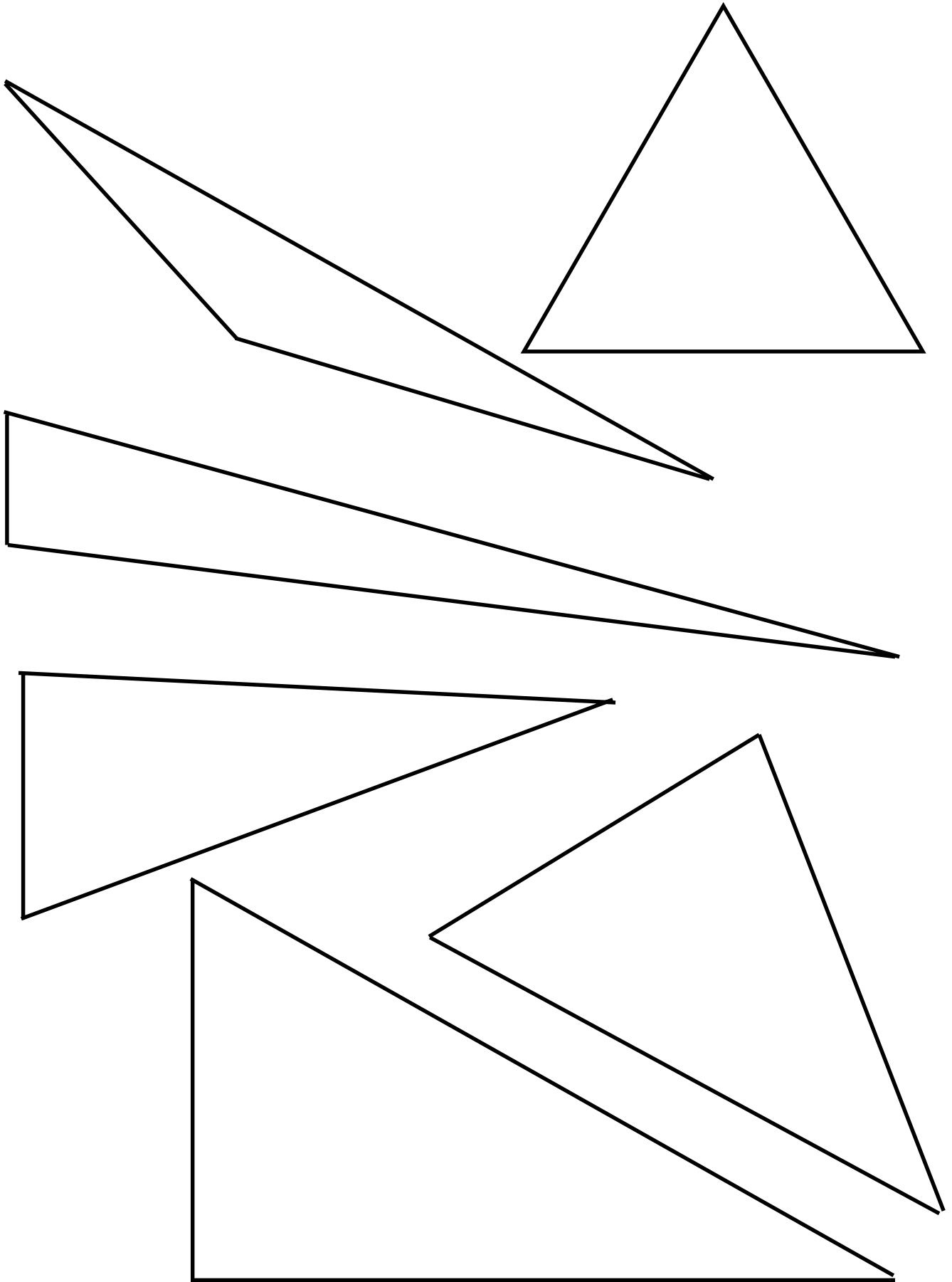
# TRIANGLE PATTERNS



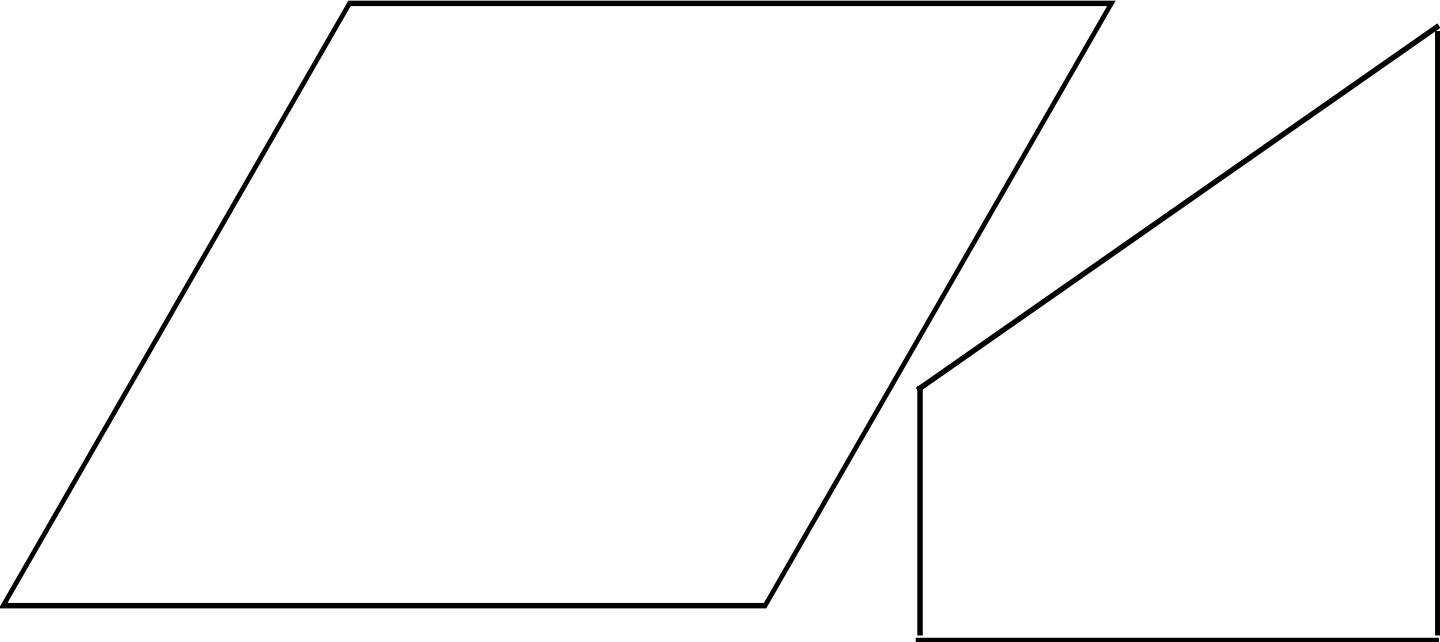
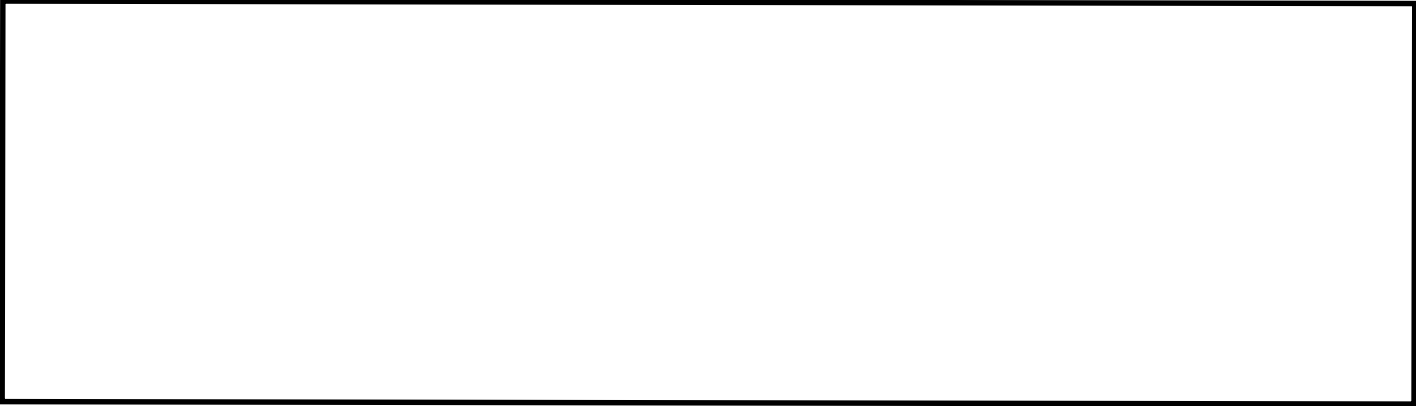
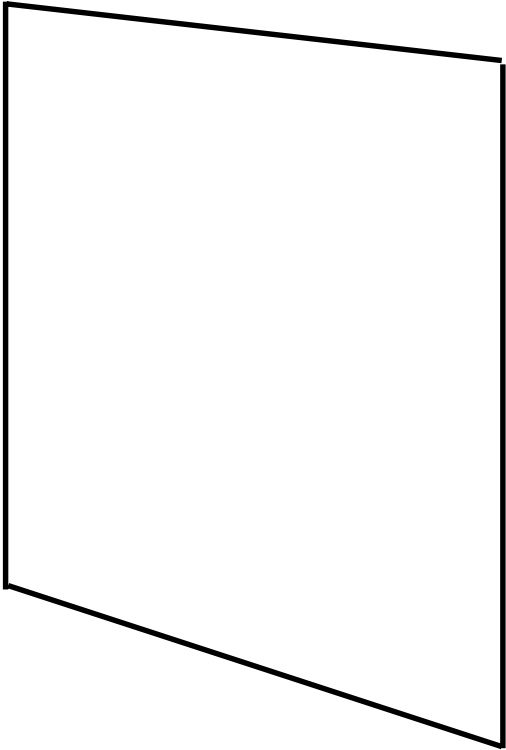
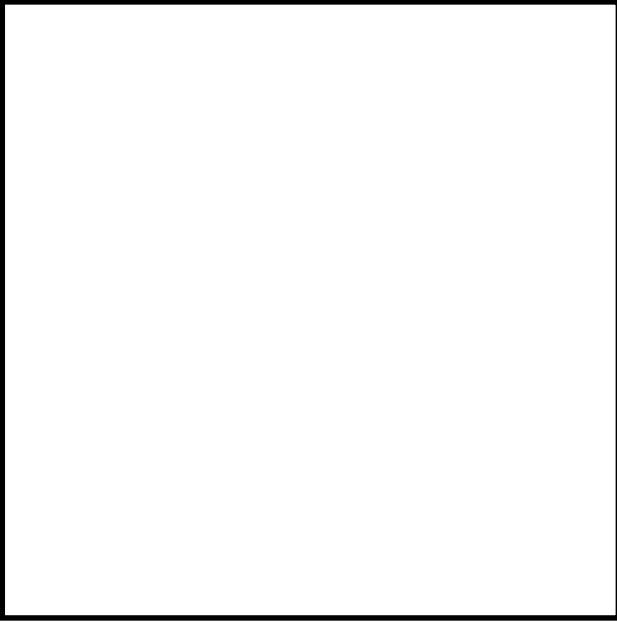
# TRIANGLE PATTERNS



# TRIANGLE PATTERNS

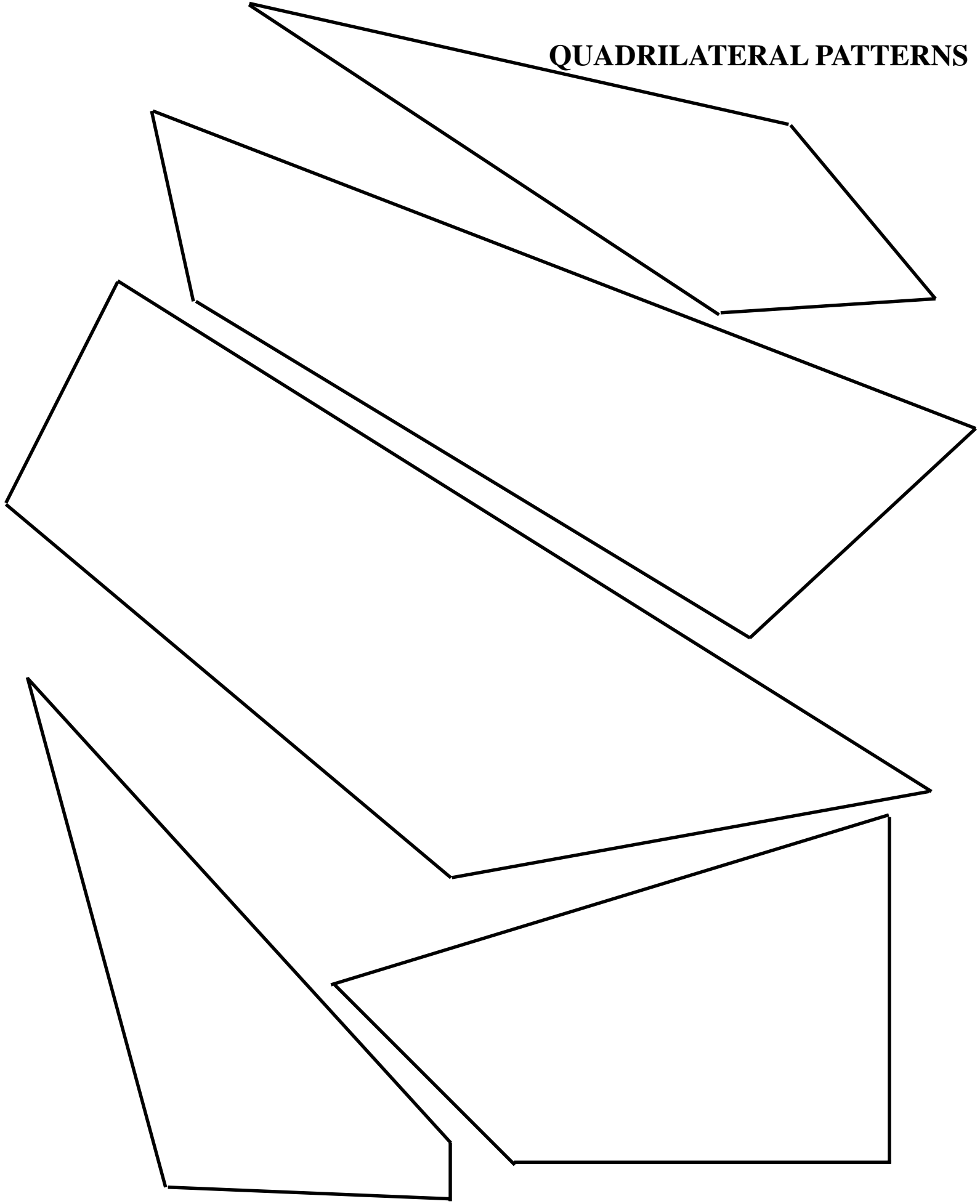


# QUADRILATERAL PATTERNS

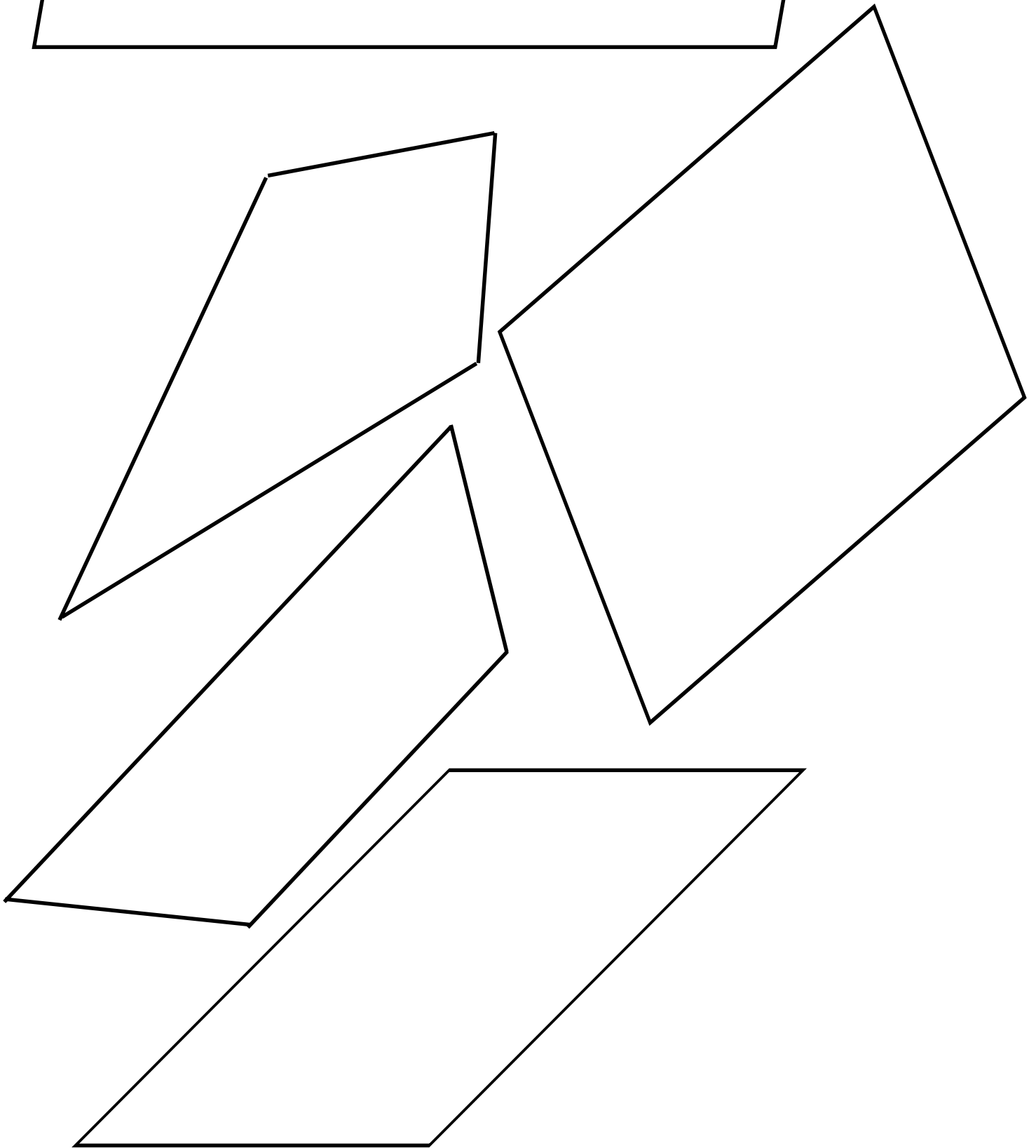




# QUADRILATERAL PATTERNS



# QUADRILATERAL PATTERNS



**NORTH  
CAROLINA**

**NORTH  
CAROLINA**

NAME \_\_\_\_\_

DATE \_\_\_\_\_

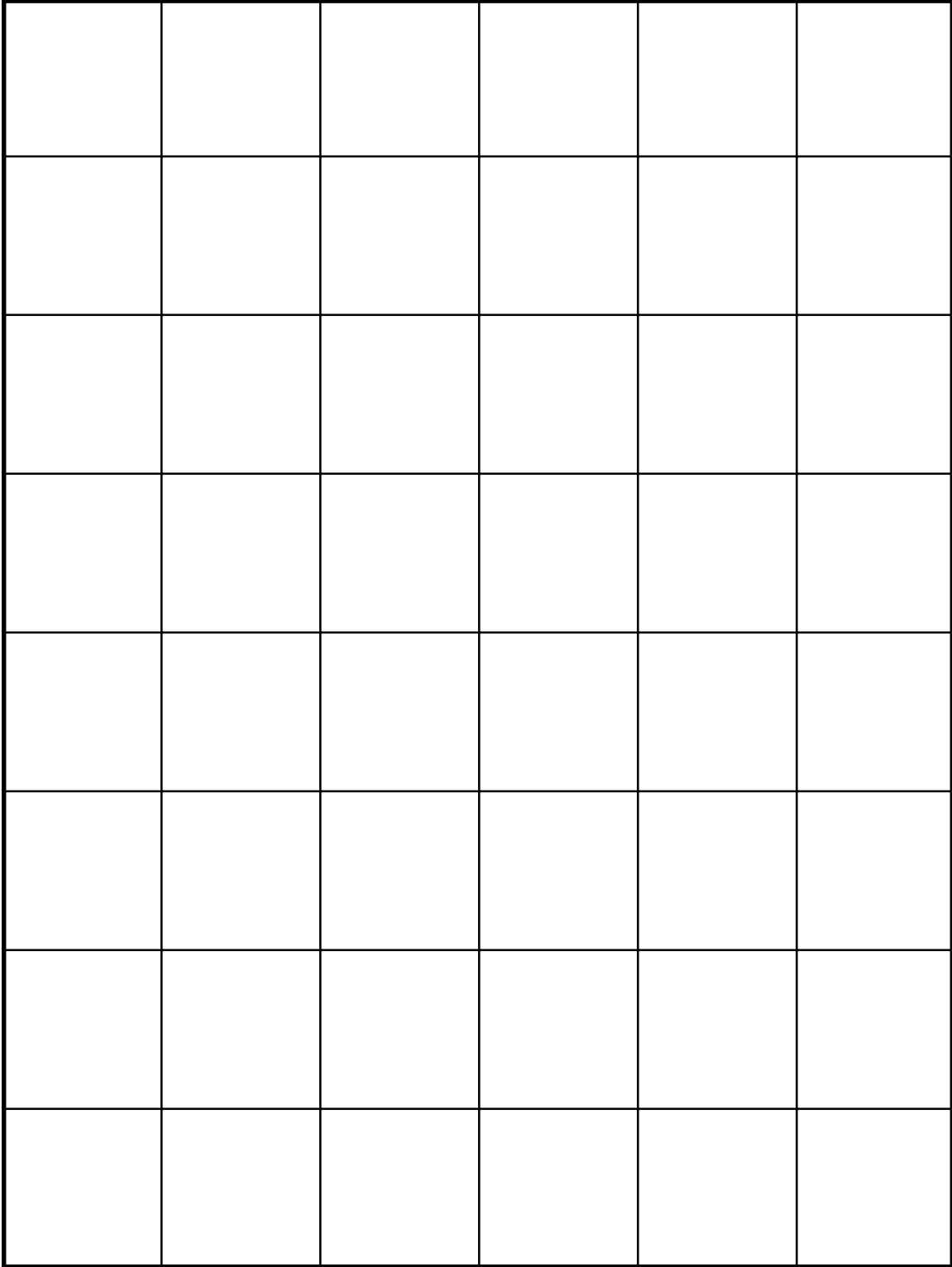
Polygon	Diagonals	Angle of intersection	Do they bisect each other?

NAME \_\_\_\_\_

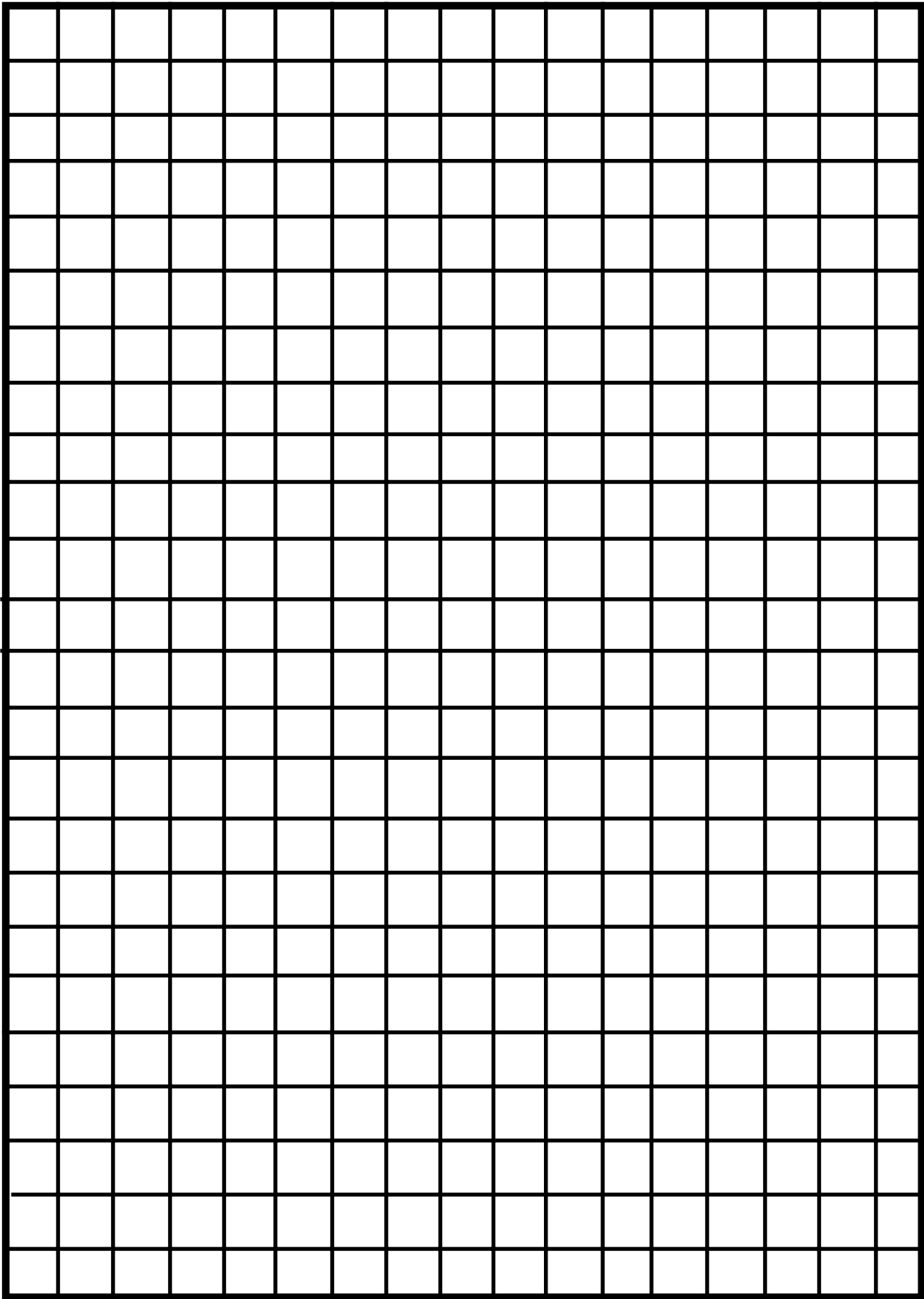
DATE \_\_\_\_\_

Polygon	Diagonals	Angle of intersection	Do they bisect each other?

# One-Inch Graph Paper

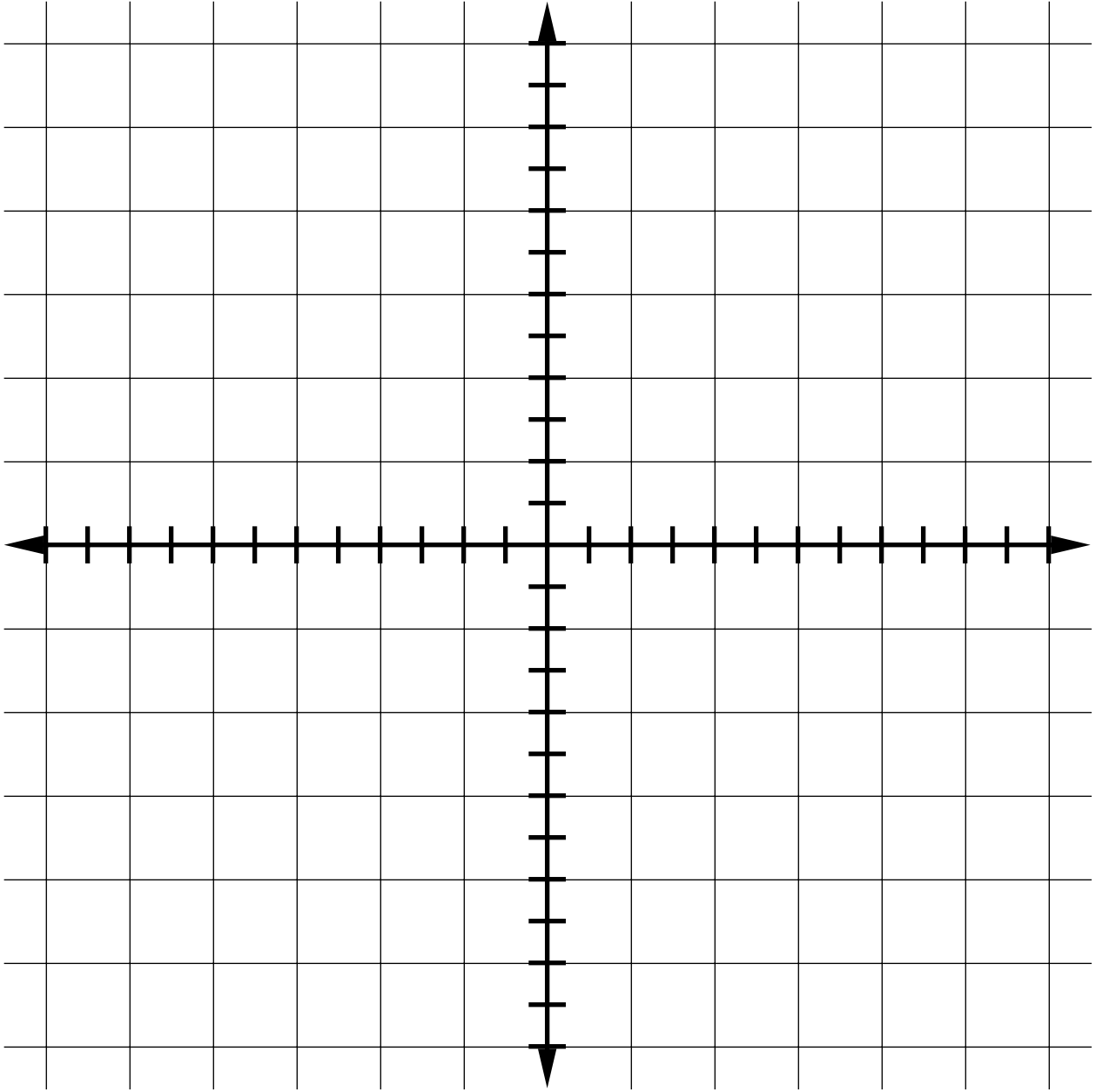


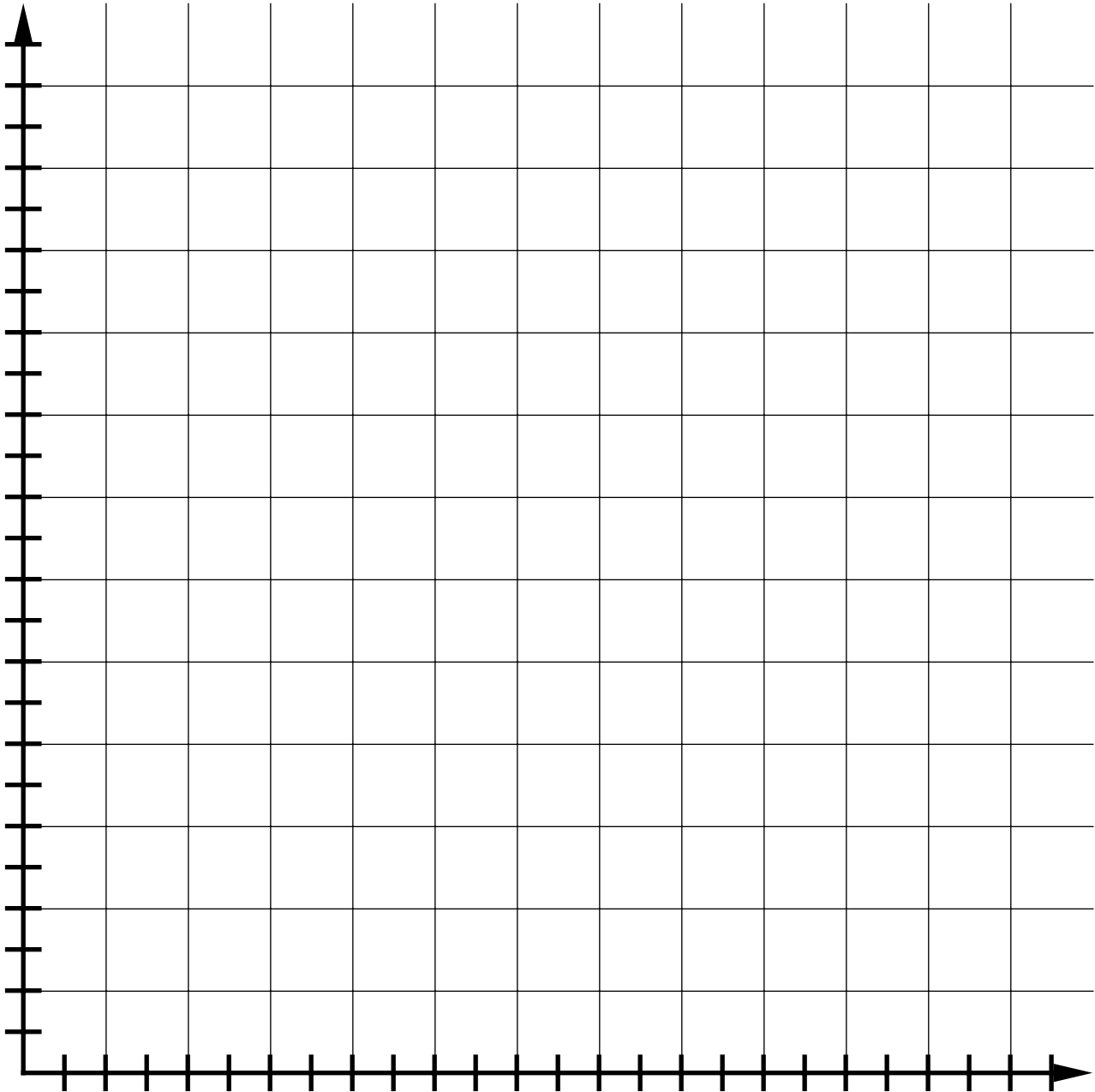
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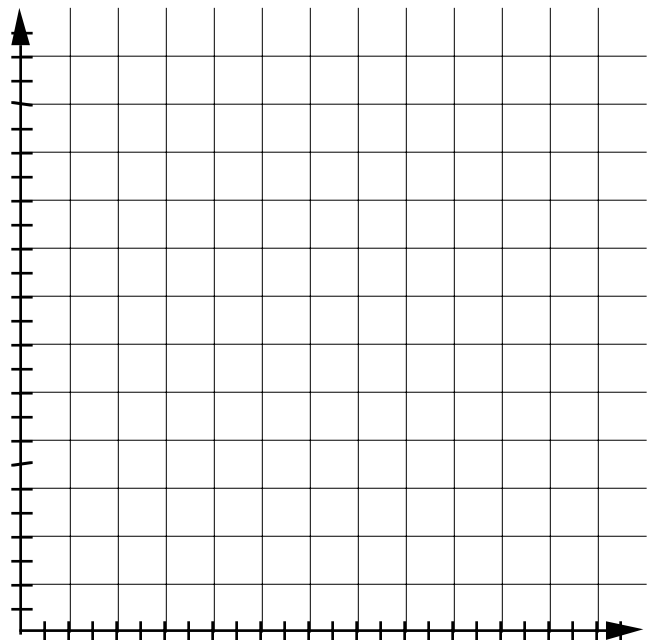
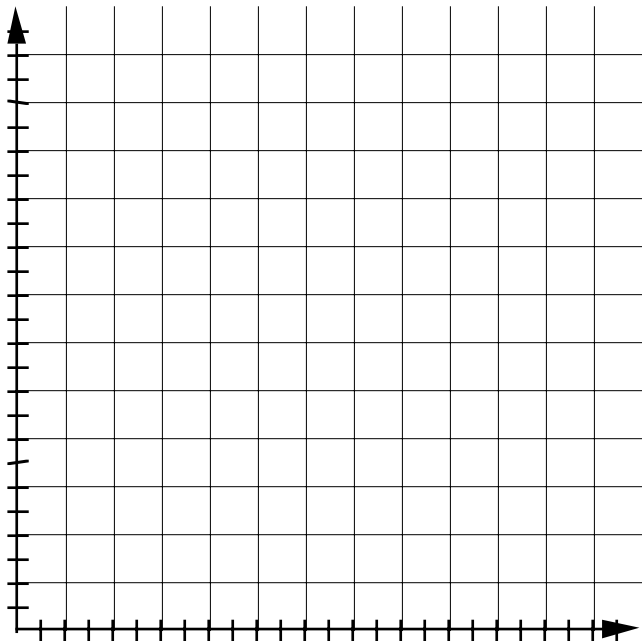
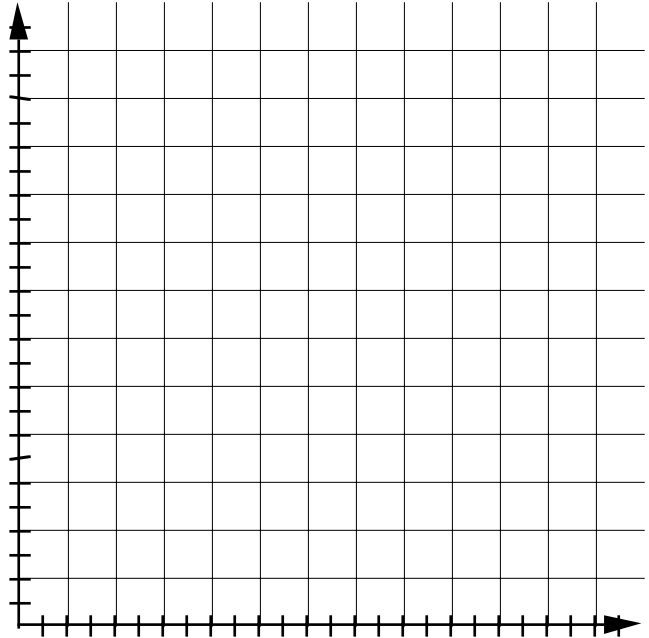
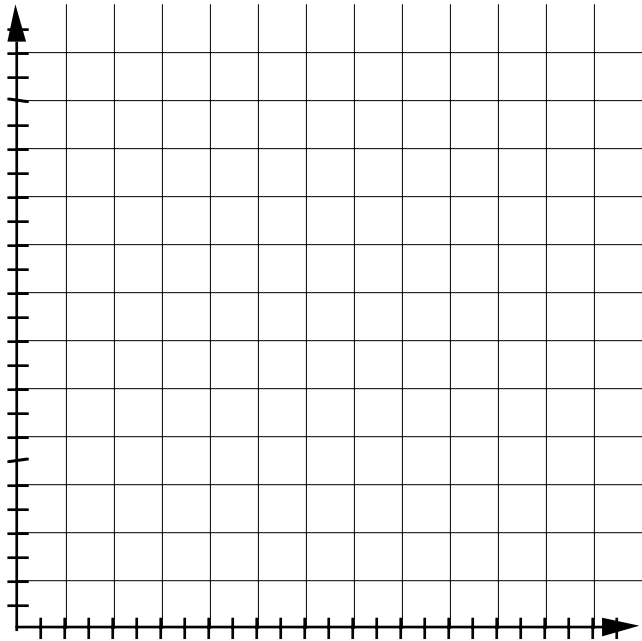
DATE

NAME



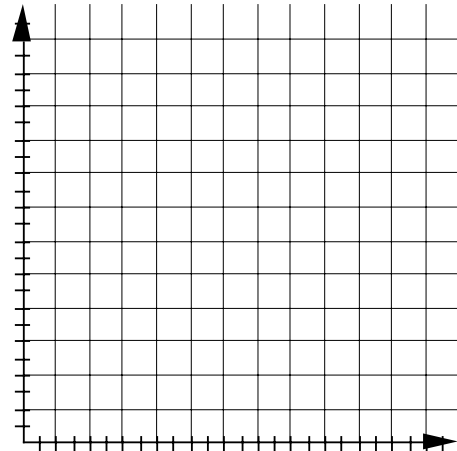
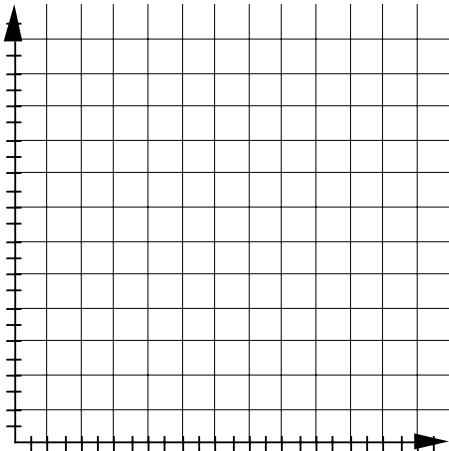
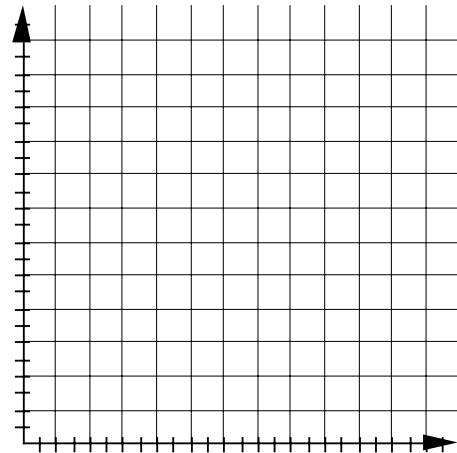
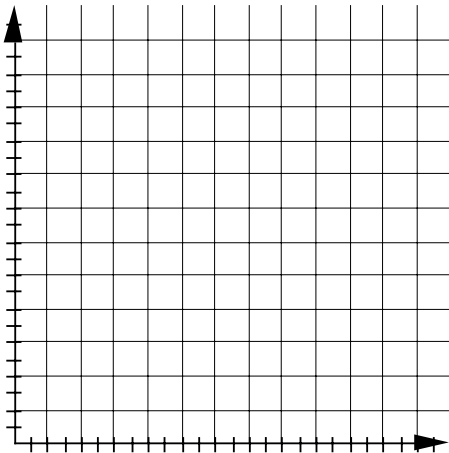
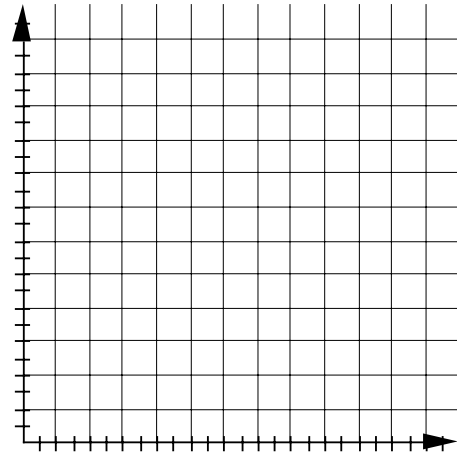
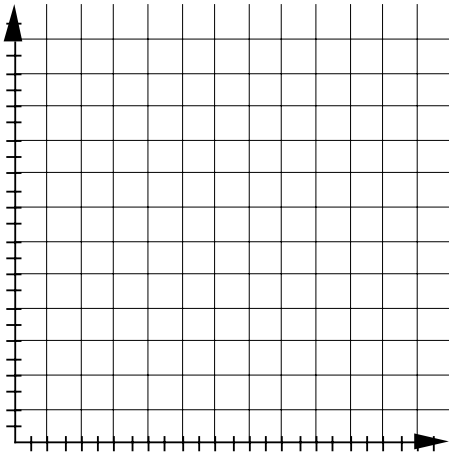




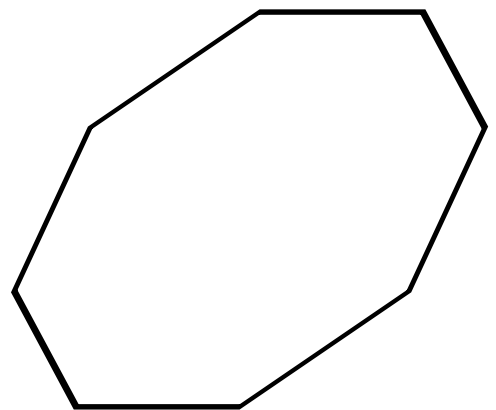
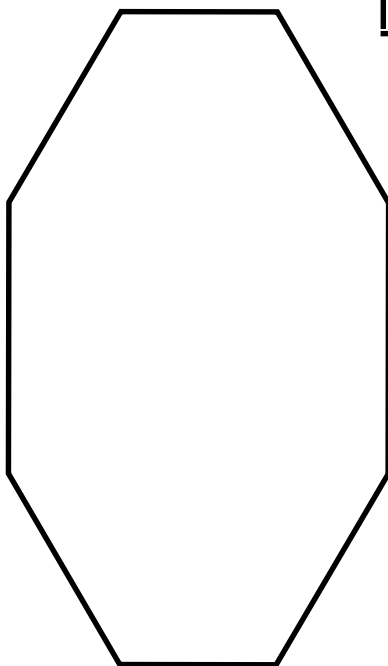
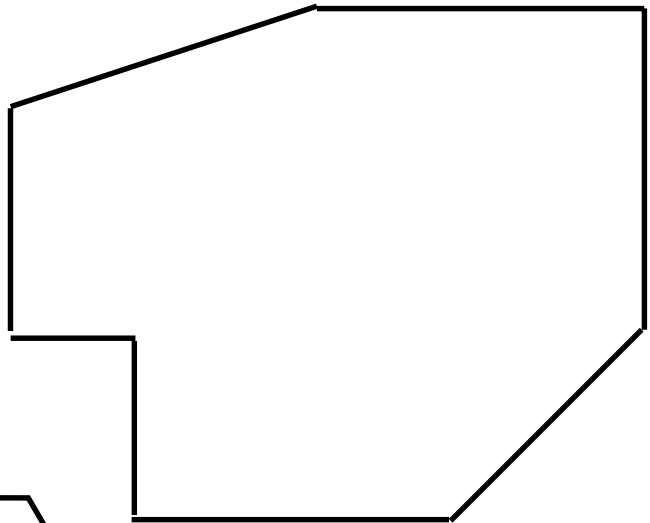
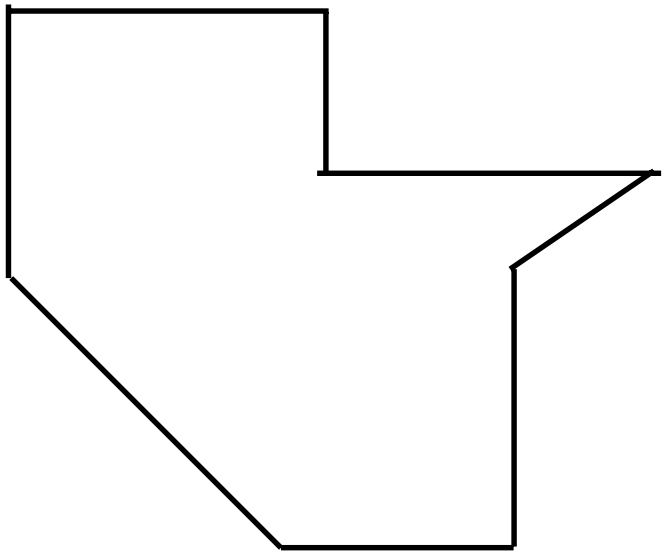
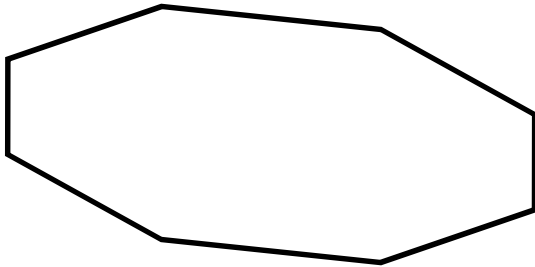
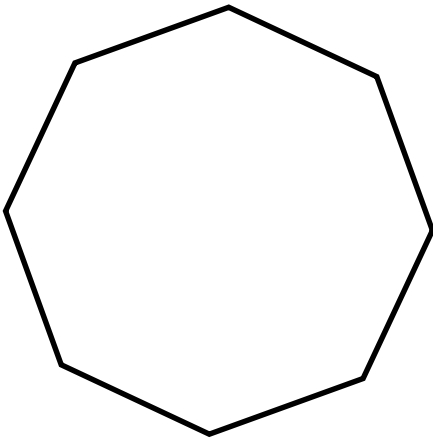


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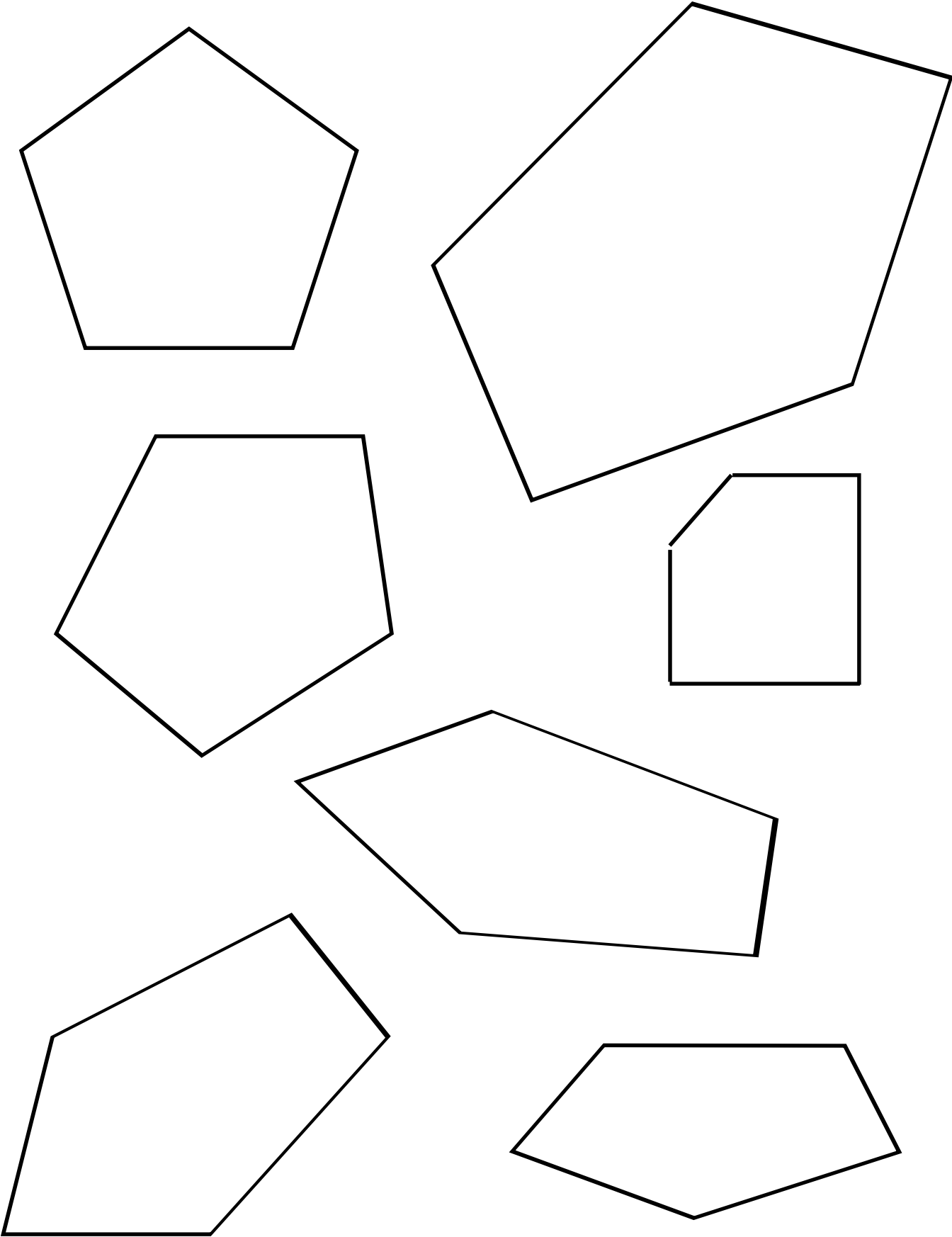
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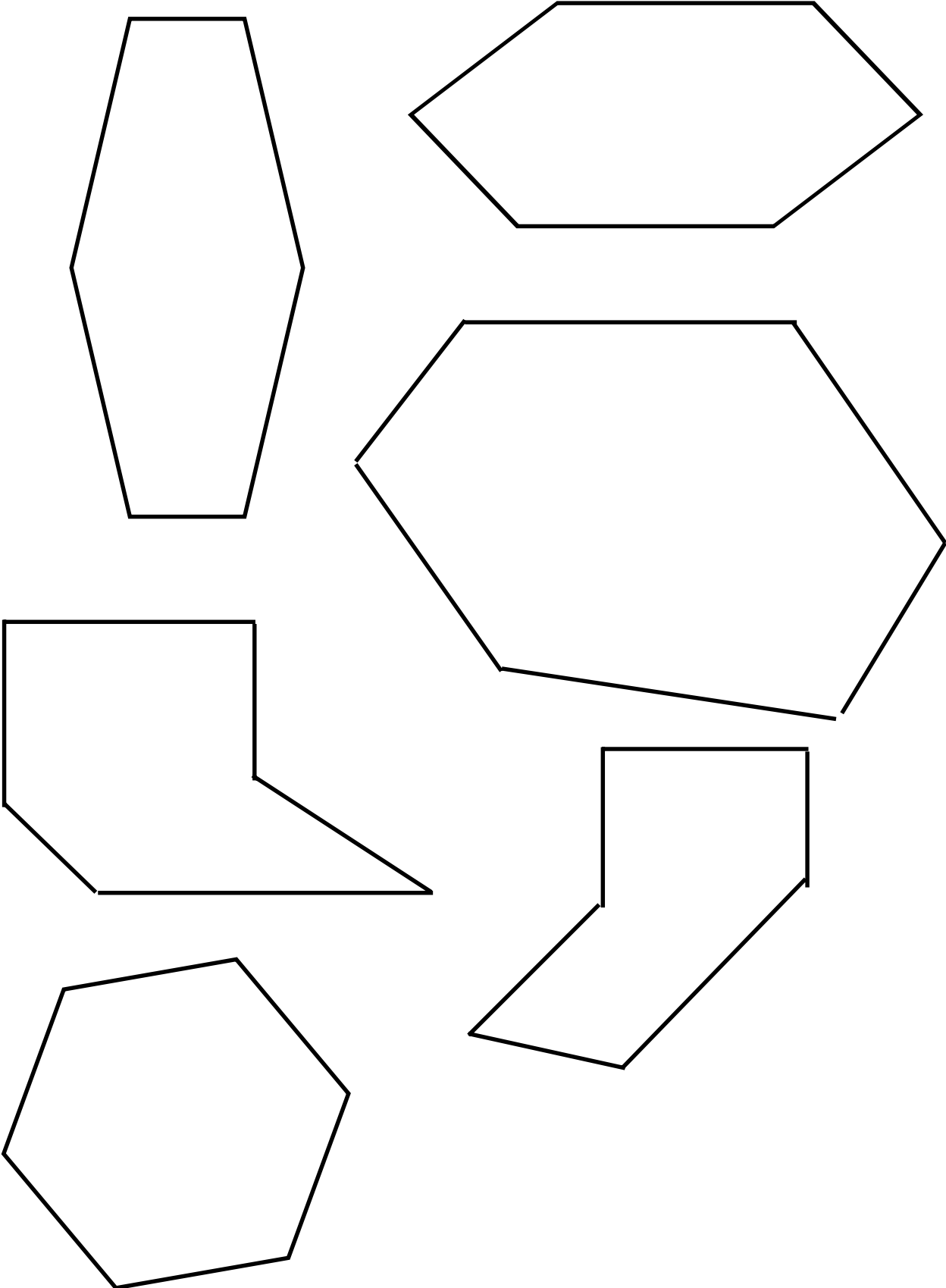
# OCTAGON PATTERNS



# PENTAGON PATTERNS



# HEXAGON PATTERNS



## Triangle Activities

1. Use chenille stems or pipe cleaners to make triangles with sides corresponding to the lengths (in inches) listed below.

Figure	Side A	Side B	Side C	Makes a triangle?
1	4	4	4	Yes No
2	3	4	5	Yes No
3	3	4	4	Yes No
4	2	4	6	Yes No
5	2	4	4	Yes No
6	3	3	4	Yes No
7	2	2	4	Yes No
8	1	2	4	Yes No
9	1	2	3	Yes No
10	2	3	4	Yes No

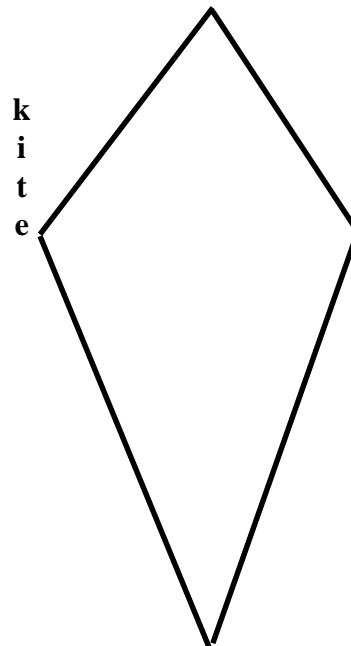
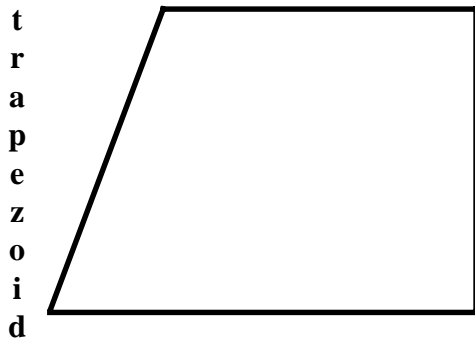
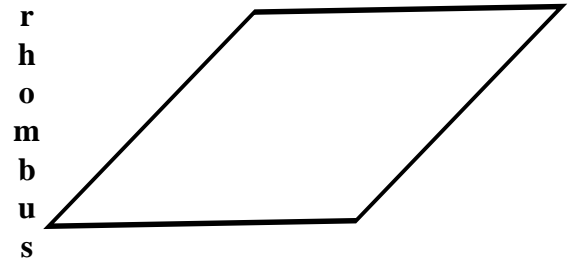
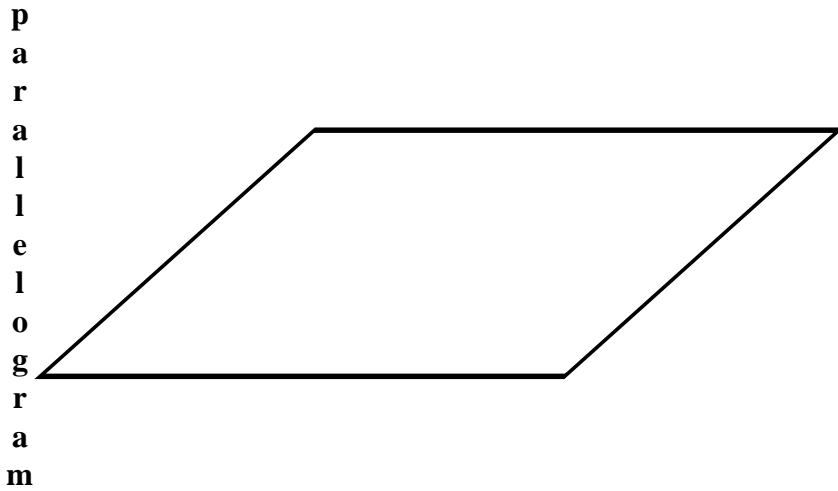
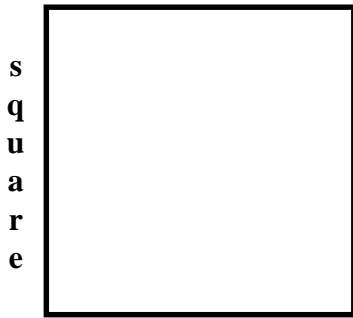
2. When do you think it is possible for three lengths to make or not make a triangle?

3. Classify the triangles you made as equilateral, isosceles, scalene, and the angles as right, acute, or obtuse.

4. What relationships do you see between the sides and angles of triangles? You may wish to draw more triangles to test your ideas. Be sure to explain your thinking.

## Discovering Diagonals I

Draw the diagonals in each polygon. Indicate if they are congruent (C), perpendicular (P), bisectors (B), or lines of symmetry (S).



## Discovering Diagonals II

1. Complete the chart below.

<b>Polygon</b>	<b>No. of sides/vertices</b>	<b>No. of diagonals</b>
triangle		
quadrilateral		
pentagon		
hexagon		
heptagon		
octagon		

2. Look at the chart. What patterns do you see? Are there any predictions you can make about other polygons and the number of their diagonals?

3. Using your prediction or pattern what can you say about the number of diagonals in the following polygons. Be sure to explain your thinking.

**Decagon**

**Dodecagon**

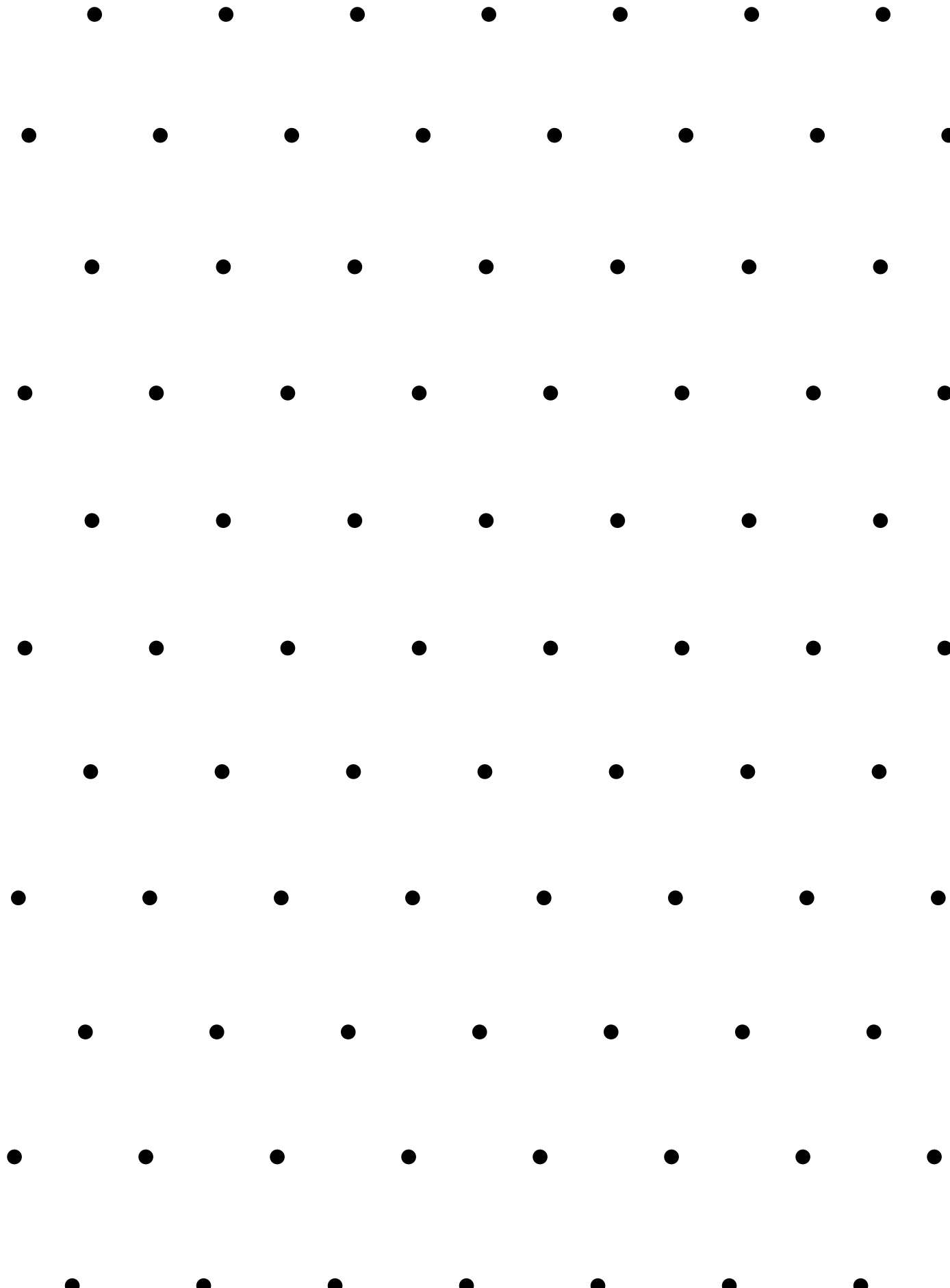
**N-gon**

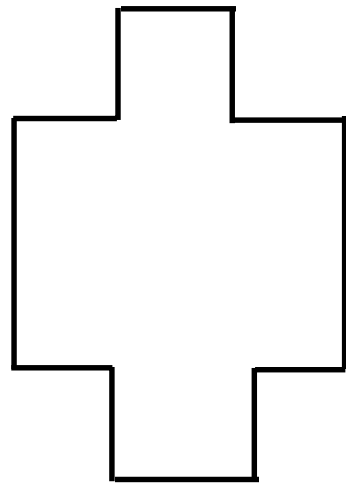
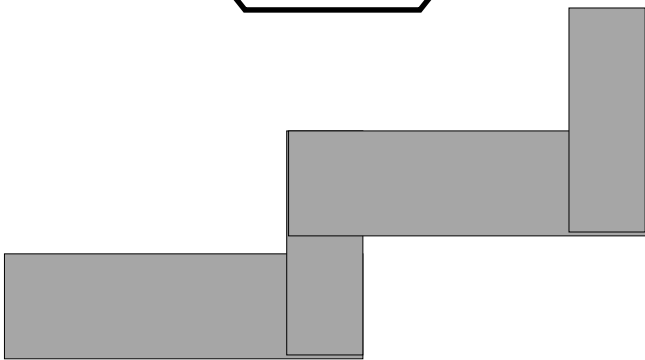
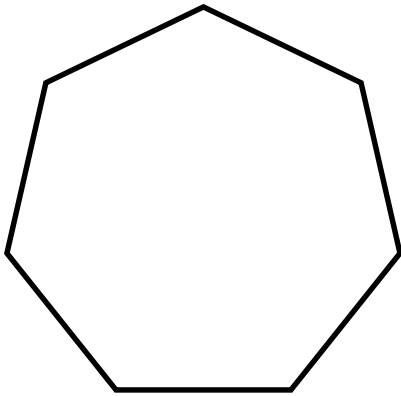
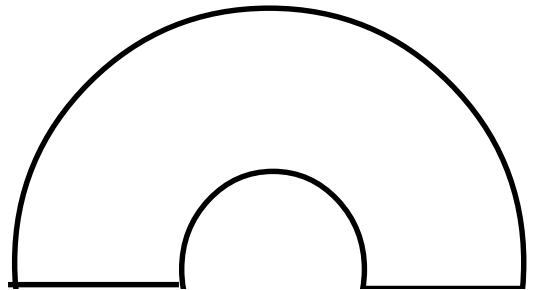
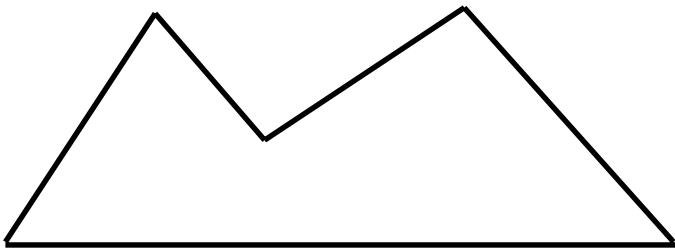
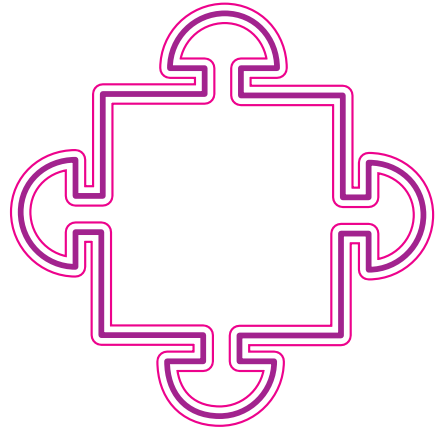
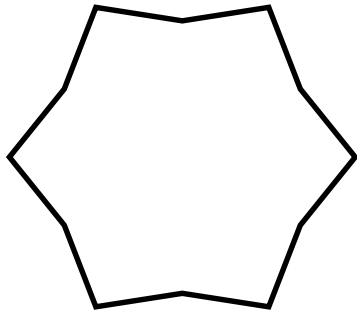


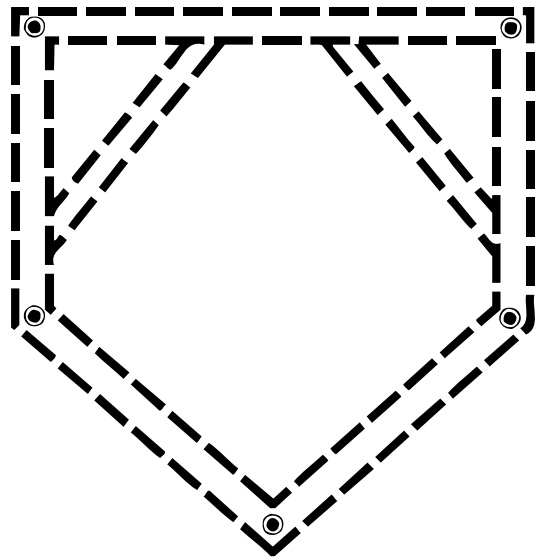
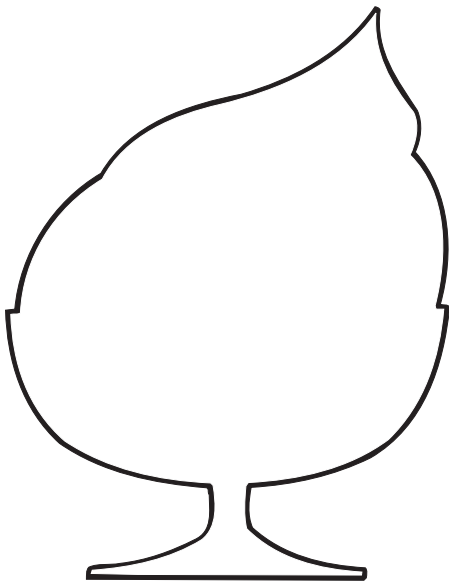
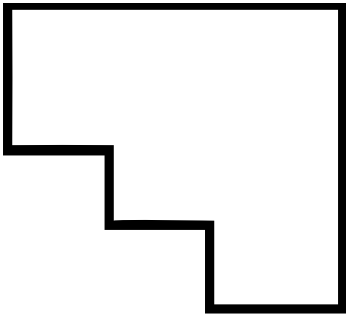
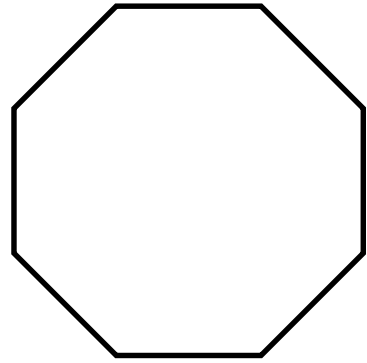
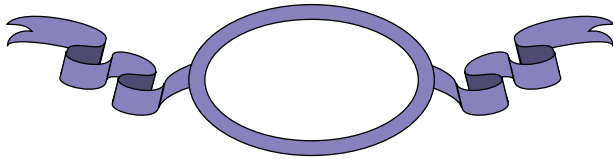
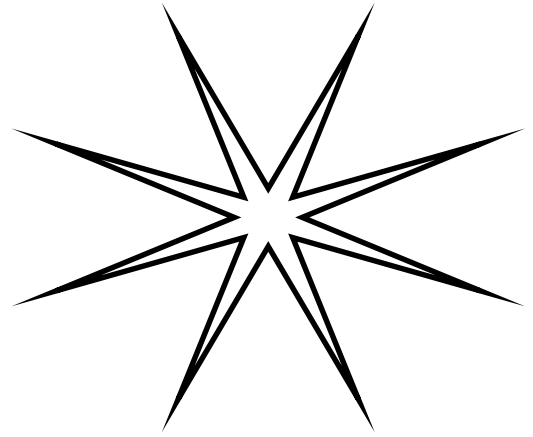
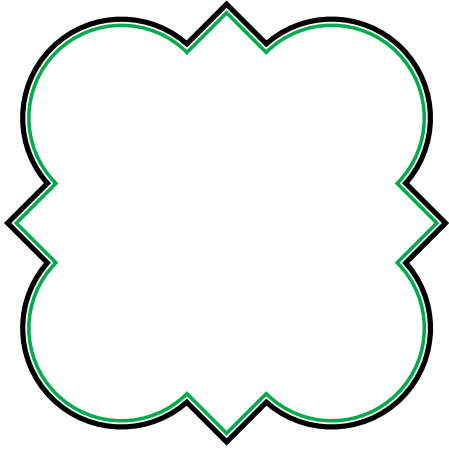
# Isometric Dot Paper

DATE \_\_\_\_\_

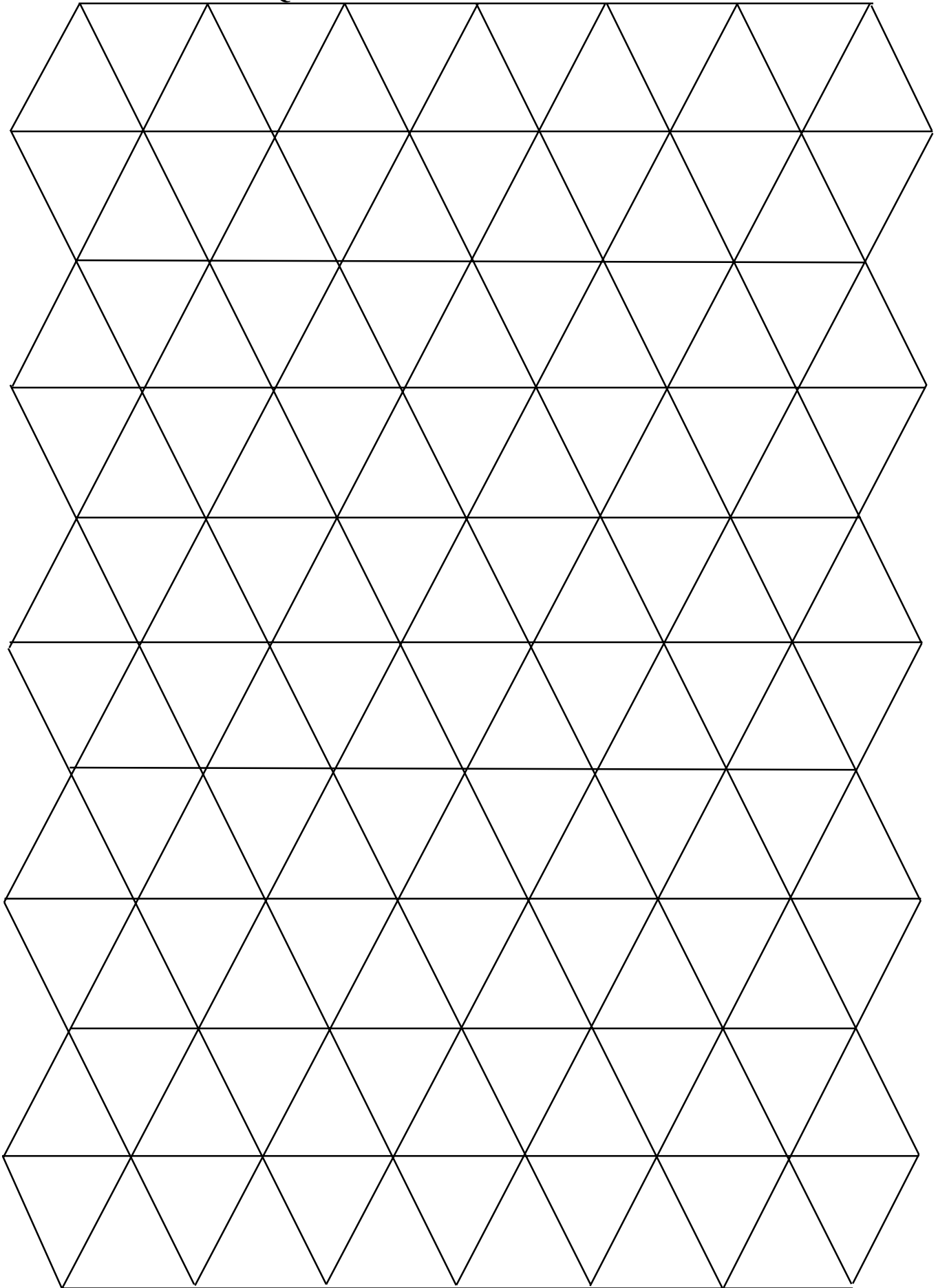
NAME \_\_\_\_\_







# EQUILATERAL TRIANGLE GRID



Name \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

## DISCOVERING DIAGONALS I

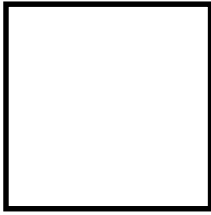
<b>Quadrilateral</b>	<b>Number of diagonals</b>	<b>Congruent Diagonals (yes/no)</b>	<b>Perpendicular Diagonals (yes/no)</b>	<b>Parallel Diagonals (yes/no)</b>	<b>No. of pairs of congruent triangles</b>
<b>Square</b>					
<b>Rectangle</b>					
<b>Parallelogram</b>					
<b>Rhombus</b>					
<b>Trapezoid</b>					
<b>Kite</b>					
<b>Your Figure</b>					

CONCLUSIONS:

# DISCOVERING DIAGONALS I

Draw the diagonals in each figure. Tell whether they are congruent and/or perpendicular.

**SQUARE**



**Congruent?**  
**Perpendicular?**

**RECTANGLE**



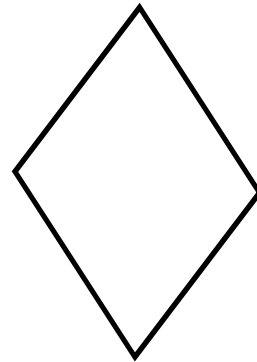
**Congruent?**  
**Perpendicular?**

**PARALLELOGRAM**



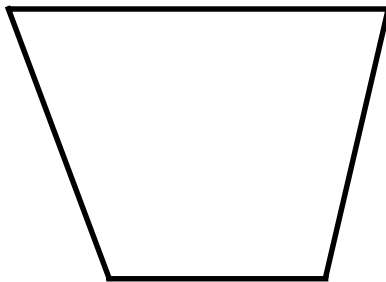
**Congruent?**  
**Perpendicular?**

**RHOMBUS**



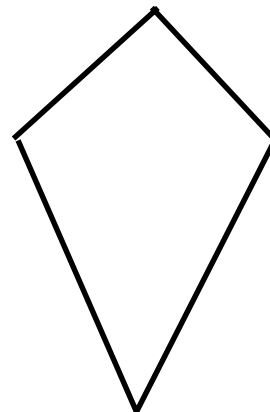
**Congruent?**  
**Perpendicular?**

**TRAPEZOID**



**Congruent?**  
**Perpendicular?**

**KITE**



**Congruent?**  
**Perpendicular?**

Name \_\_\_\_\_ Date \_\_\_/\_\_\_/\_\_\_



## DISCOVERING DIAGONALS II

<b>POLYGON</b>	<b>NUMBER OF SIDES/VERTICES</b>	<b>NUMBER OF DIAGONALS</b>
<b>triangle</b>		
<b>quadrilateral</b>		
<b>pentagon</b>		
<b>hexagon</b>		
<b>heptagon</b>		
<b>octagon</b>		
<b>nonagon</b>		
<b>decagon</b>		

CONCLUSIONS:

Name \_\_\_\_\_ Date \_\_\_ / \_\_\_ / \_\_\_

## QUADRILATERALS

1. Use the materials provided to make quadrilaterals with sides corresponding to the lengths listed below. Record whether or not a quadrilateral is possible.

Color	Length of Sides (in inches)				Does it make a quadrilateral?
Red	3	3	3	3	
Orange	4	2	4	2	
Yellow	4	4	2	2	
Blue	2	2	2	6	
Green	2	2	2	4	
Pink	2	4	3	3	
White	2	3	3	4	
Black	1	2	3	4	

2. What type of quadrilateral did each color make?

3. Make a conjecture to explain when the four lengths will or will not make a quadrilateral.

4. Which quadrilaterals have symmetry? Line or rotational? Are certain kinds of quadrilaterals always symmetric?





Name \_\_\_\_\_ Date \_\_\_ / \_\_\_ / \_\_\_

# PERFECTLY SQUARE

MEASUREMENT OF DIAGONAL	MEASUREMENT OF SIDE	OBSERVATIONS



# ATTRIBUTE GAME

<p><b>Exactly one pair of adjacent, congruent sides.</b></p>	<p><b>Four right angles.</b></p>	<p><b>Opposite sides are congruent.</b></p>
<p><b>Adjacent sides are congruent.</b></p>	<p><b>No sides are congruent.</b></p>	<p><b>Diagonals bisect each other.</b></p>
<p><b>Two pairs of adjacent, congruent sides.</b></p>	<p><b>A regular polygon.</b></p>	<p><b>An irregular polygon.</b></p>
<p><b>Exactly one pair of parallel sides.</b></p>	<p><b>Two pairs of parallel sides.</b></p>	<p><b>Exactly one pair of opposite, congruent sides.</b></p>
<p><b>Congruent diagonals.</b></p>	<p><b>Perpendicular diagonals.</b></p>	<p><b>At least one obtuse angle.</b></p>

## Exploring Angles in Polygons

**A.** Cut out triangles A through E. Tear off the corners of each triangle and fit them side by side with the angles touching around a point. Do each triangle separately.

1. What do you notice about the sum of the angles of these triangles?
  
  
  
  
  
  
  
  
  
2. Would this work for all triangles? Make some of your own and try them.

**B.** Cut out quadrilaterals A through E. Tear off the corners of each quadrilateral and fit them side by side with the angles touching around a point. Do each quadrilateral separately.

1. What did you discover?
  
  
  
  
  
  
  
  
  
2. What can you say about the sum of the angles of these quadrilaterals?
  
  
  
  
  
  
  
  
  
3. Would this work for all quadrilaterals? Make some of your own and try them.
  
  
  
  
  
  
  
  
  
4. How do these results compare and relate to the results you found for triangles?



**C.** Try this process with pentagons and hexagons. Explore and explain what you find.

**D.** Make a conjecture about the relationship of the number of sides and the the sum of the interior angles of a polygon. Explain your thinking.

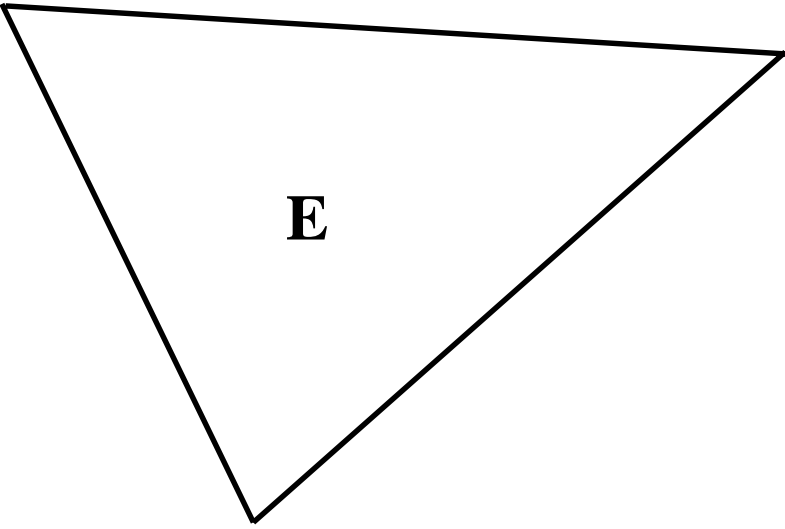
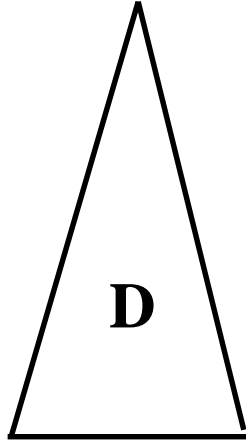
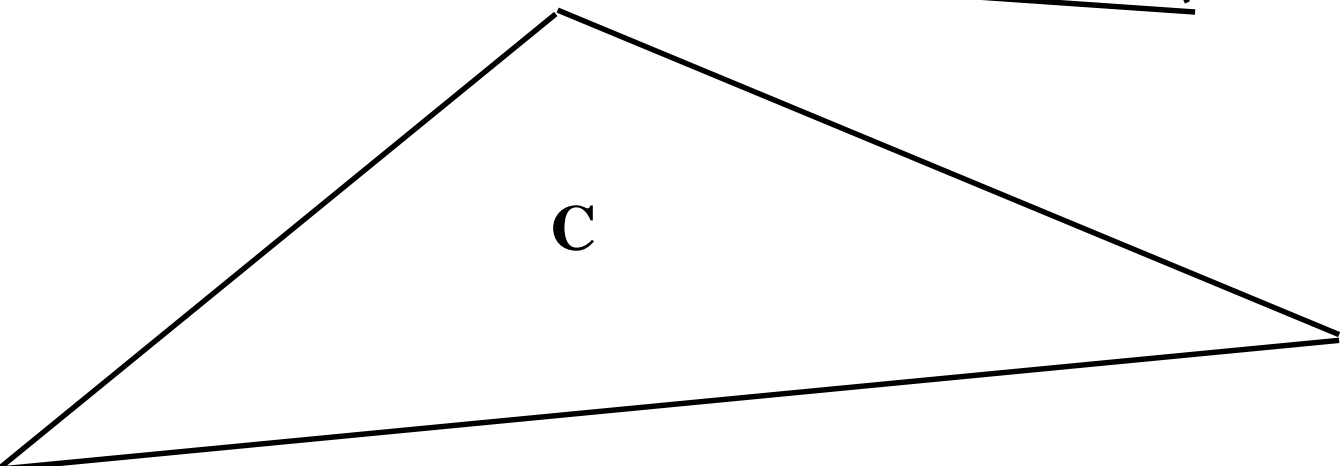
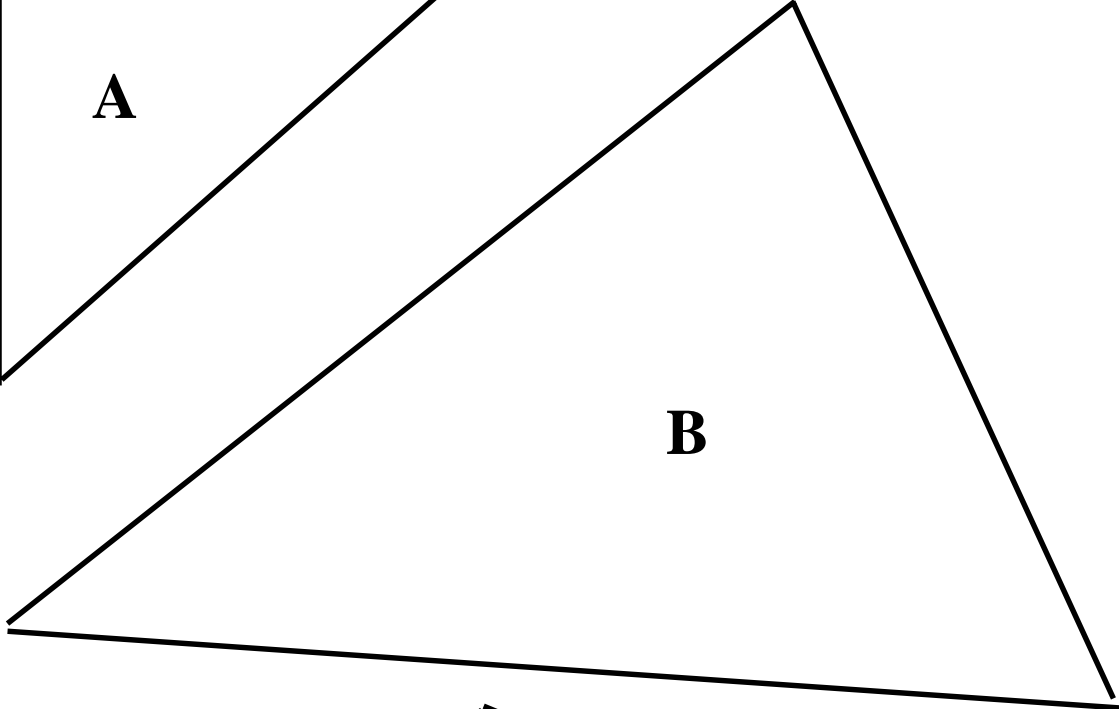
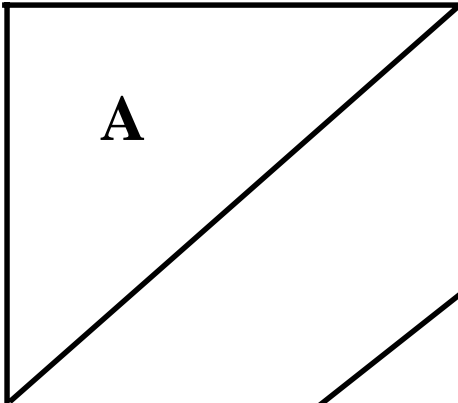
Use your conjecture to find the sum of the interior angles of the following:

octagon -

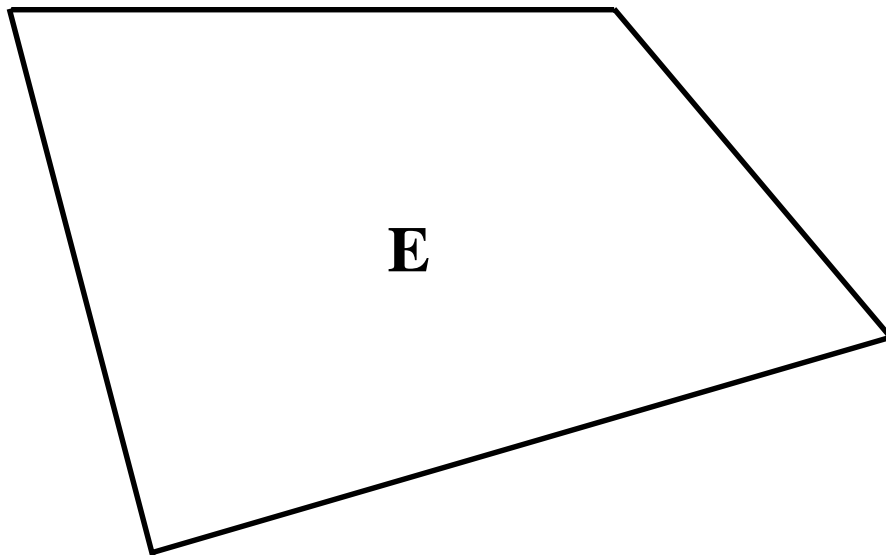
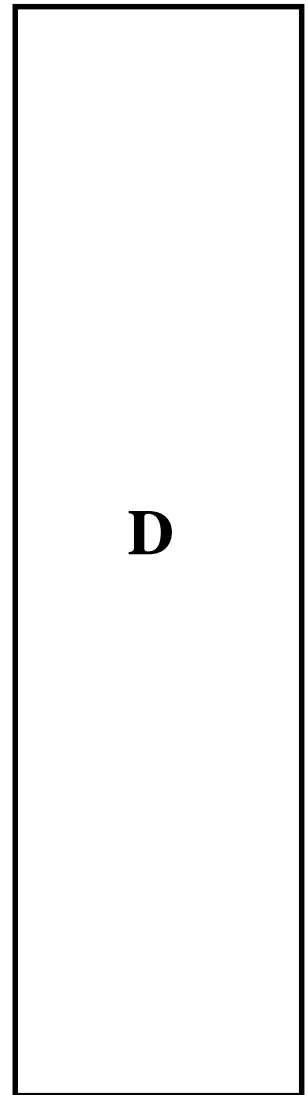
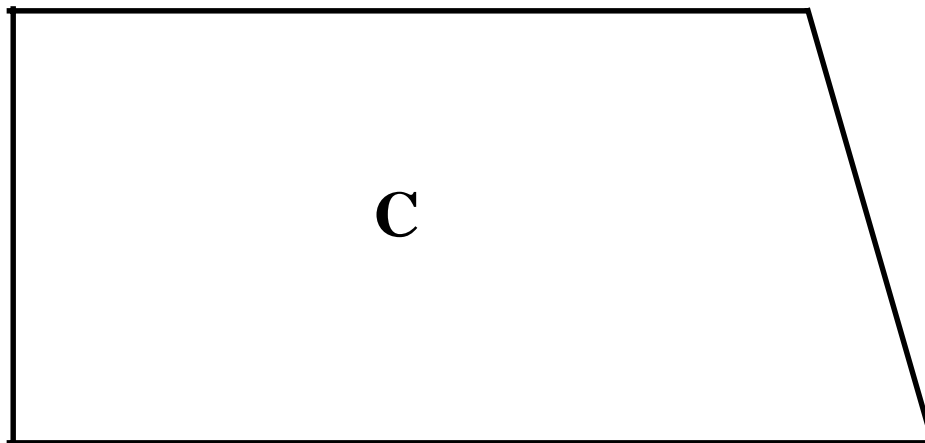
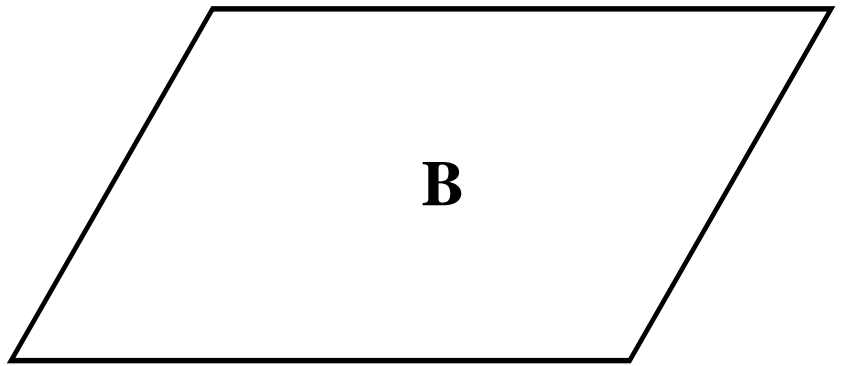
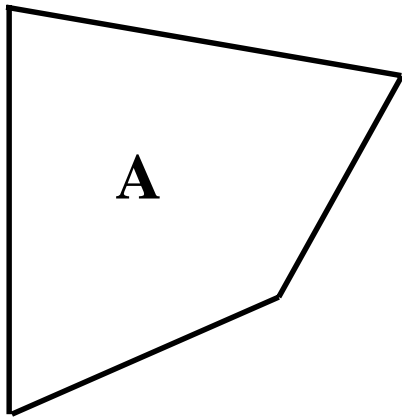
decagon -

n-gon -

# Exploring Angles - Triangles



# Exploring Angles - Quadrilaterals



# Exploring Angles - Other Polygons

