

6.1 Polygons

Goal: Identify and describe polygons. Find angle measures of quadrilaterals.

Polygon: a plane figure that is formed by _____ or more segments called _____. Each side intersects exactly two other sides at each of its endpoints.

Vertex of a polygon: the _____ of a side

Diagonal of a polygon: a segment that joins two nonconsecutive _____ of a polygon

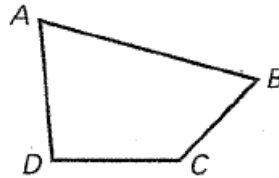
Classifying Polygons by Sides	
Number of Sides	Name
3	
4	
5	
6	
7	
8	
9	
10	
n	

Use polygon ABCD at the right.

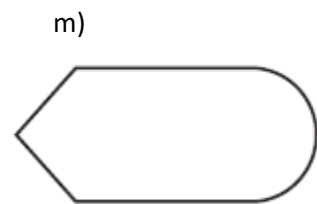
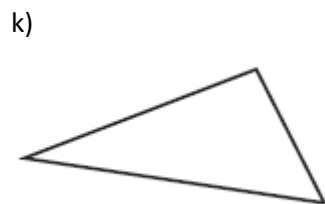
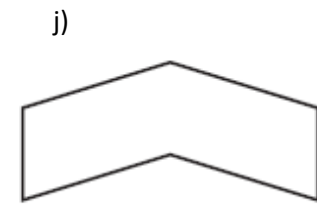
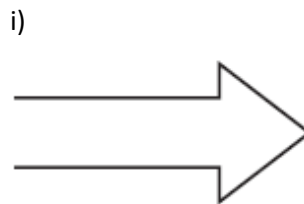
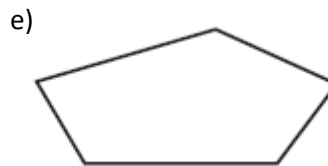
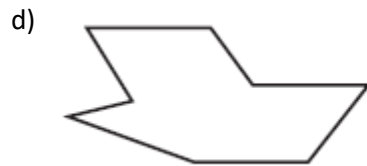
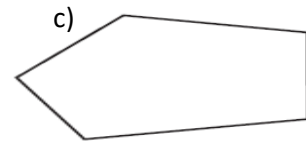
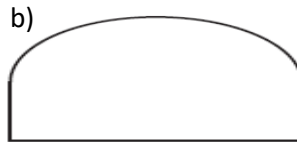
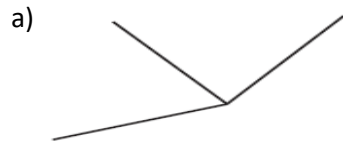
Name all vertices: _____

Name all sides: _____

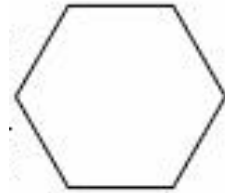
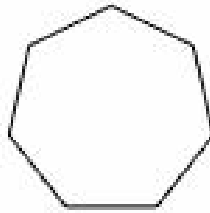
Name all diagonals: _____



Determine if each figure is a polygon. If it is, classify it by its sides. If not, explain your reasoning.

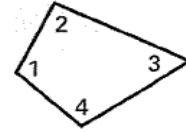


Draw all diagonals for the figures below.



Quadrilateral Interior Angles Theorem: The sum of

the measures of the angles in a quadrilateral is



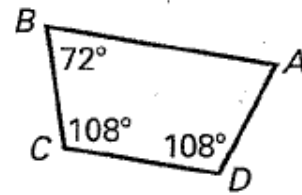
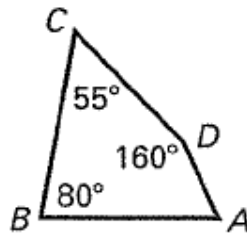
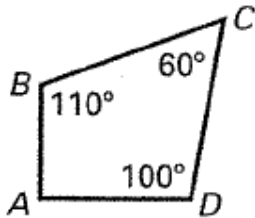
_____ + _____ + _____ + _____ = _____

Find $m\angle A$.

a) _____

b) _____

c) _____

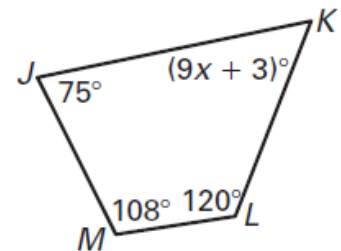
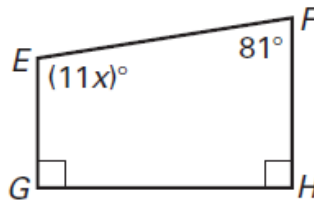
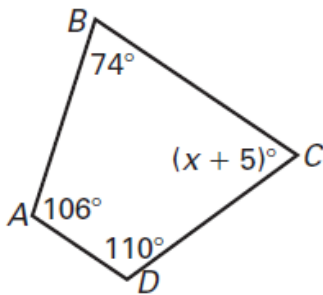


Find the value of x .

a) $x =$ _____

b) $x =$ _____

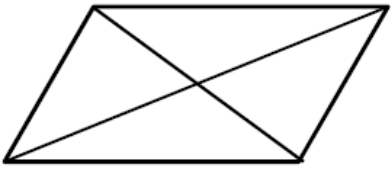
c) $x =$ _____



6.2 Properties of Parallelograms

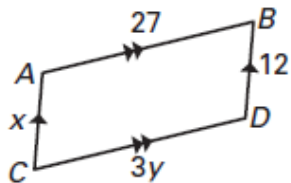
Goal: Use properties of parallelograms to find missing angles and lengths.

Parallelogram: a _____ in which both pairs of opposite sides are parallel

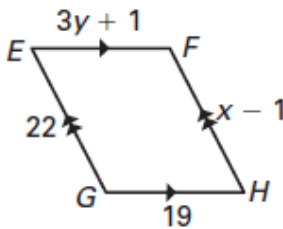
Properties of Parallelograms	
	<ul style="list-style-type: none"> ▪ Opposite sides are _____. ▪ Opposite sides are _____. ▪ Opposite angles are _____. ▪ Consecutive angles are _____. ▪ Diagonals _____ each other.

Use properties of parallelogram to find the values of x and y.

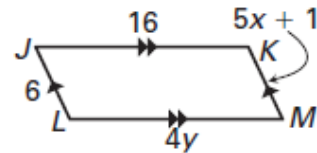
a) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



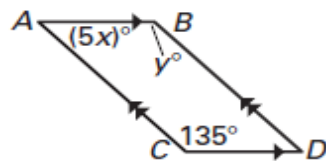
b) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



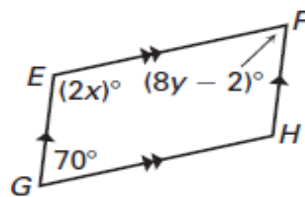
c) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



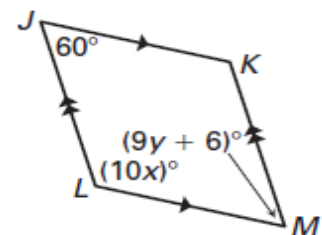
e) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



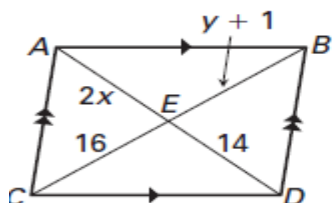
f) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



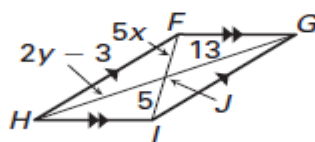
g) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



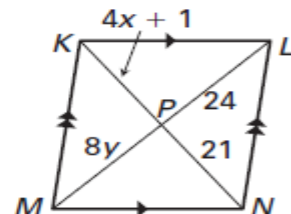
h) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



i) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

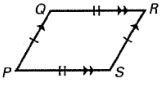
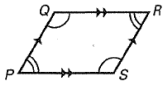
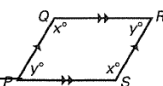
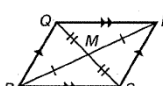


j) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$



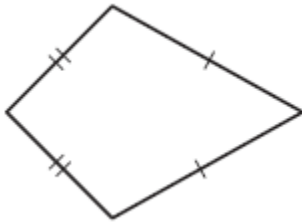
6.3 Showing Quadrilaterals are Parallelograms

Goal: Use properties to determine whether a quadrilateral is a parallelogram

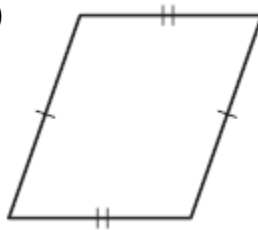
<p>If both pairs of opposite sides of a quadrilateral are _____, then the quadrilateral is a _____.</p>	<p>If _____ \cong _____ and _____ \cong _____, then PQRS is a parallelogram</p> 
<p>If both pairs of opposite angles of a quadrilateral are _____, then the quadrilateral is a _____.</p>	<p>If _____ \cong _____ and _____ \cong _____, then PQRS is a parallelogram</p> 
<p>If an angle of a quadrilateral is _____ to both of its consecutive angles, then the quadrilateral is a parallelogram</p>	<p>If _____ + _____ = _____ and _____ + _____ = _____, then PQRS is a parallelogram</p> 
<p>If the diagonals of a quadrilateral _____, then the quadrilateral is a parallelogram.</p>	<p>If _____ \cong _____ and _____ \cong _____, then PQRS is a parallelogram</p> 

Tell whether each quadrilateral is a parallelogram. Explain your reasoning.

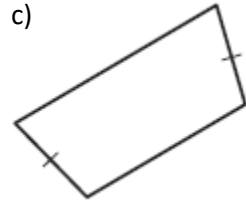
a)



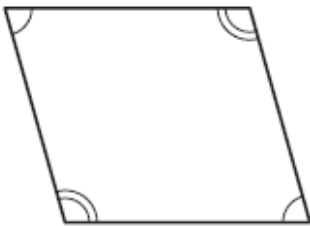
b)



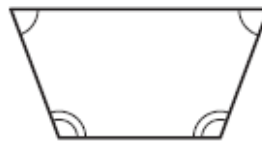
c)



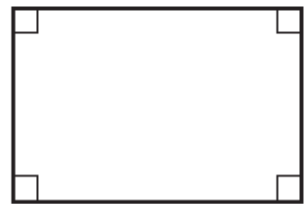
e)



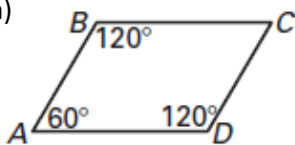
f)



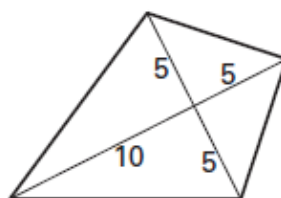
g)



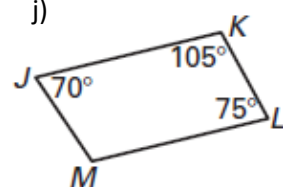
h)



i)



j)



If a quadrilateral is a parallelogram, then the opposite sides are parallel. On coordinate plane, two lines are parallel if they have the same _____.

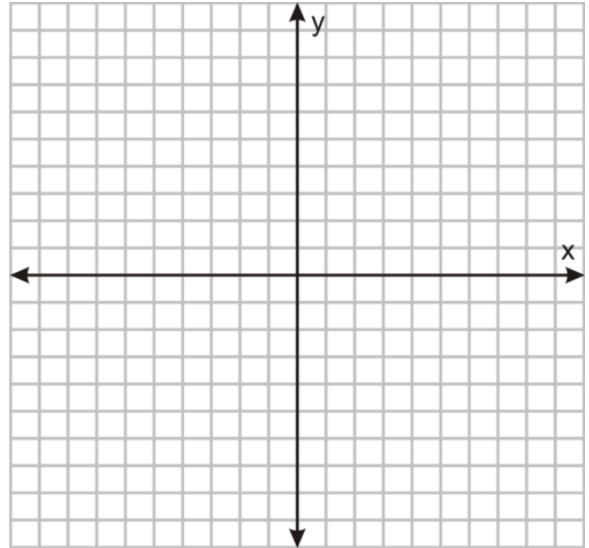
Graph each quadrilateral, then use slope to determine if it is a parallelogram.

a) $A(2,1)$ $B(5,2)$ $C(5,7)$ $D(2,6)$

Slope AB: _____ Slope CD: _____

Slope BC: _____ Slope AD: _____

Parallelogram? _____

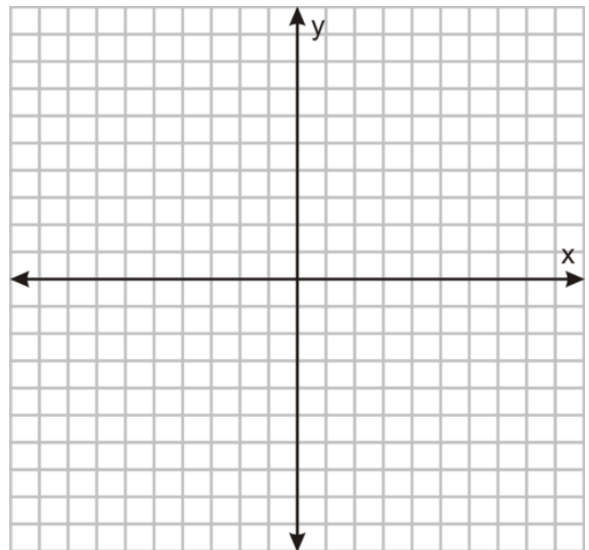


b) $R(-5,7)$ $S(2,6)$ $T(4,-1)$ $V(-4,0)$

Slope RS: _____ Slope TV: _____

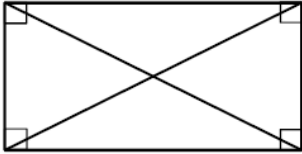
Slope ST: _____ Slope RV: _____

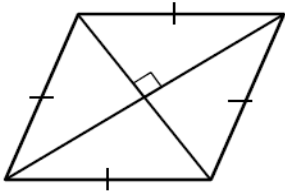
Parallelogram? _____

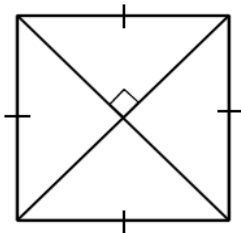


6.4 Rhombuses, Rectangles, and Squares

Goal: Use properties of special types of parallelograms

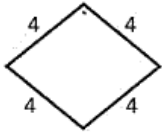
Properties of Rectangles	
	<ul style="list-style-type: none">▪ Opposite sides are _____.▪ Opposite sides are _____.▪ Opposite angles are _____.▪ Consecutive angles are _____.▪ Diagonals _____ each other.
Rectangles have the same properties as parallelograms, plus:	<ul style="list-style-type: none">▪ All _____ angles.▪ Diagonals are _____.

Properties of Rhombi	
	<ul style="list-style-type: none">▪ Opposite sides are _____.▪ Opposite sides are _____.▪ Opposite angles are _____.▪ Consecutive angles are _____.▪ Diagonals _____ each other.
Rhombi have the same properties as parallelograms, plus:	<ul style="list-style-type: none">▪ All sides are _____.▪ Diagonals are _____.▪ Diagonals _____ opposite _____.

Properties of Squares	
	<ul style="list-style-type: none">▪ Opposite sides are _____.▪ Opposite sides are _____.▪ Opposite angles are _____.▪ Consecutive angles are _____.▪ Diagonals _____ each other.▪ All _____ angles.▪ All sides are _____.▪ Diagonals are _____.▪ Diagonals are _____.▪ Diagonals _____ opposite _____.
Squares have ALL the properties of parallelograms, rectangles, and rhombi.	

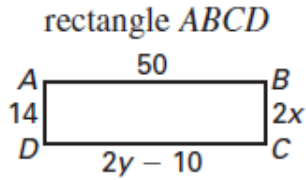
Use the information in the diagram to name the special quadrilateral.

a) _____

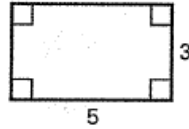


Find the values of the variables.

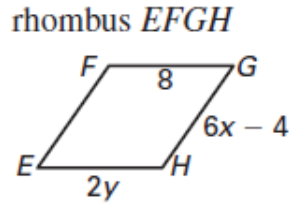
a) $x = \underline{\hspace{1cm}}$ $y = \underline{\hspace{1cm}}$



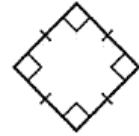
b) _____



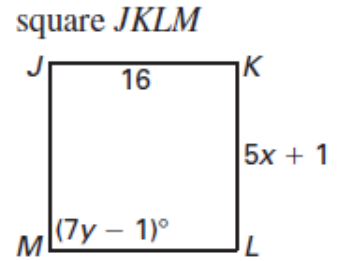
b) $x = \underline{\hspace{1cm}}$ $y = \underline{\hspace{1cm}}$



c) _____



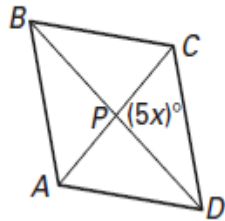
c) $x = \underline{\hspace{1cm}}$ $y = \underline{\hspace{1cm}}$



Find the value of x in each rhombus and rectangle below.

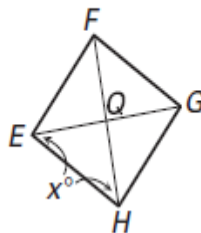
a) $x = \underline{\hspace{1cm}}$

rhombus $ABCD$



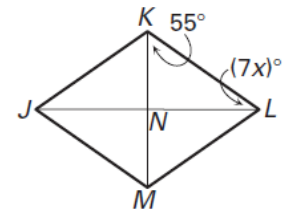
b) $x = \underline{\hspace{1cm}}$

rhombus $EFGH$



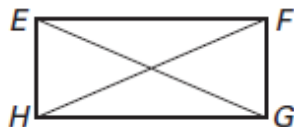
c) $x = \underline{\hspace{1cm}}$

$JKLM$ is a rhombus.



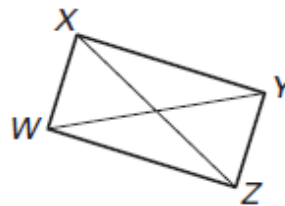
d) $x = \underline{\hspace{1cm}}$

rectangle $EFGH$, $EG = 48$, $HF = 6x$



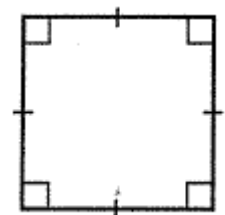
e) $x = \underline{\hspace{1cm}}$

rectangle $WXYZ$, $XZ = 37$, $WY = 5x + 2$




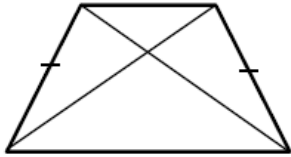
$ABCD$ has the properties shown in the picture. Is the statement true or false? Explain.

- _____ $ABCD$ is a rhombus
- _____ $ABCD$ is a parallelogram
- _____ $ABCD$ is a rectangle
- _____ The diagonals are congruent

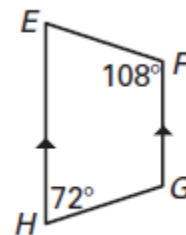
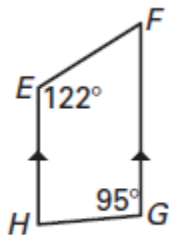
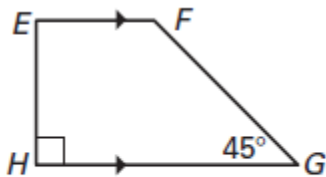


6.5 Trapezoids

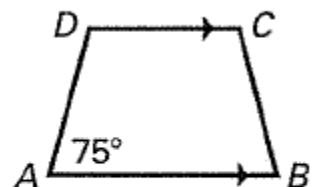
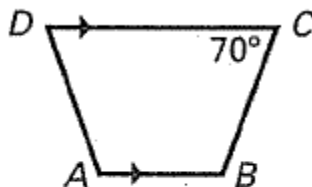
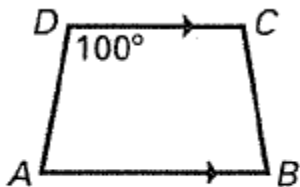
Goal: Use properties of trapezoid.

Properties of Trapezoids	
<p style="text-align: center;">Non-Isosceles Trapezoids</p> 	<ul style="list-style-type: none"> ▪ Only one pair of opposite sides are _____. ▪ Consecutive (non-base) angles are _____.
<p style="text-align: center;">Isosceles Trapezoids</p> 	<ul style="list-style-type: none"> ▪ Only one pair of opposite sides are _____. ▪ Diagonals are _____. ▪ Non-parallel sides (legs) are _____. ▪ Opposite angles are _____. ▪ Base angles are _____. ▪ Midsegment is the _____ of the two _____.

EFGH is a trapezoid. Find the missing angle measures.



ABCD is an isosceles trapezoid. Find the missing angle measures.

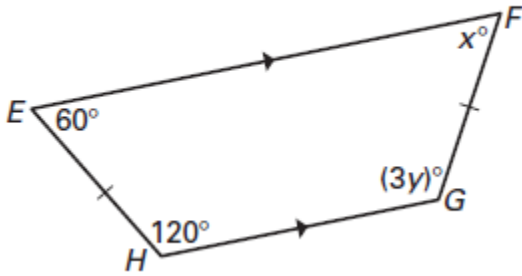


Find the value of each variable.

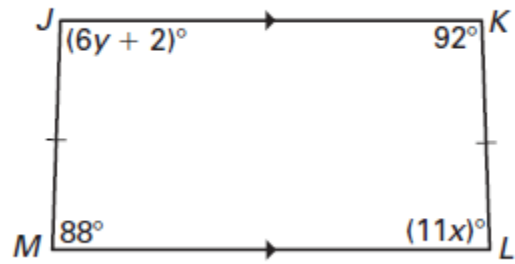
a) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

b) $x = \underline{\hspace{2cm}}$ $y = \underline{\hspace{2cm}}$

isosceles trapezoid $EFGH$

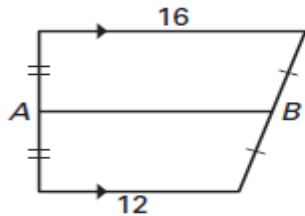


isosceles trapezoid $JKLM$

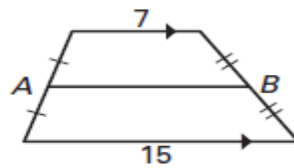


Find the length of midsegment AB . Remember that the midsegment is the average of the two bases.

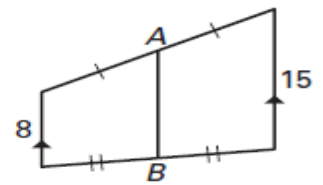
a) $\underline{\hspace{2cm}}$



b) $\underline{\hspace{2cm}}$

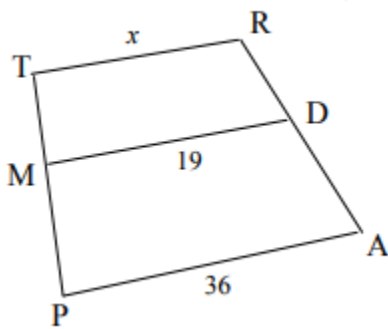


c) $\underline{\hspace{2cm}}$

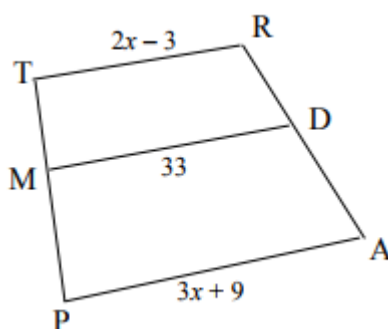


MD is the midsegment of each trapezoid. Solve for x .

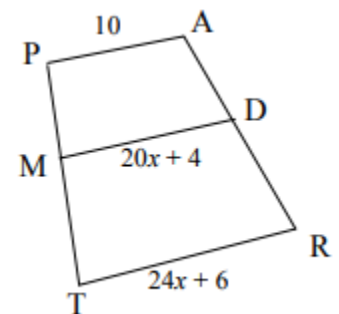
a) $\underline{\hspace{2cm}}$



b) $\underline{\hspace{2cm}}$



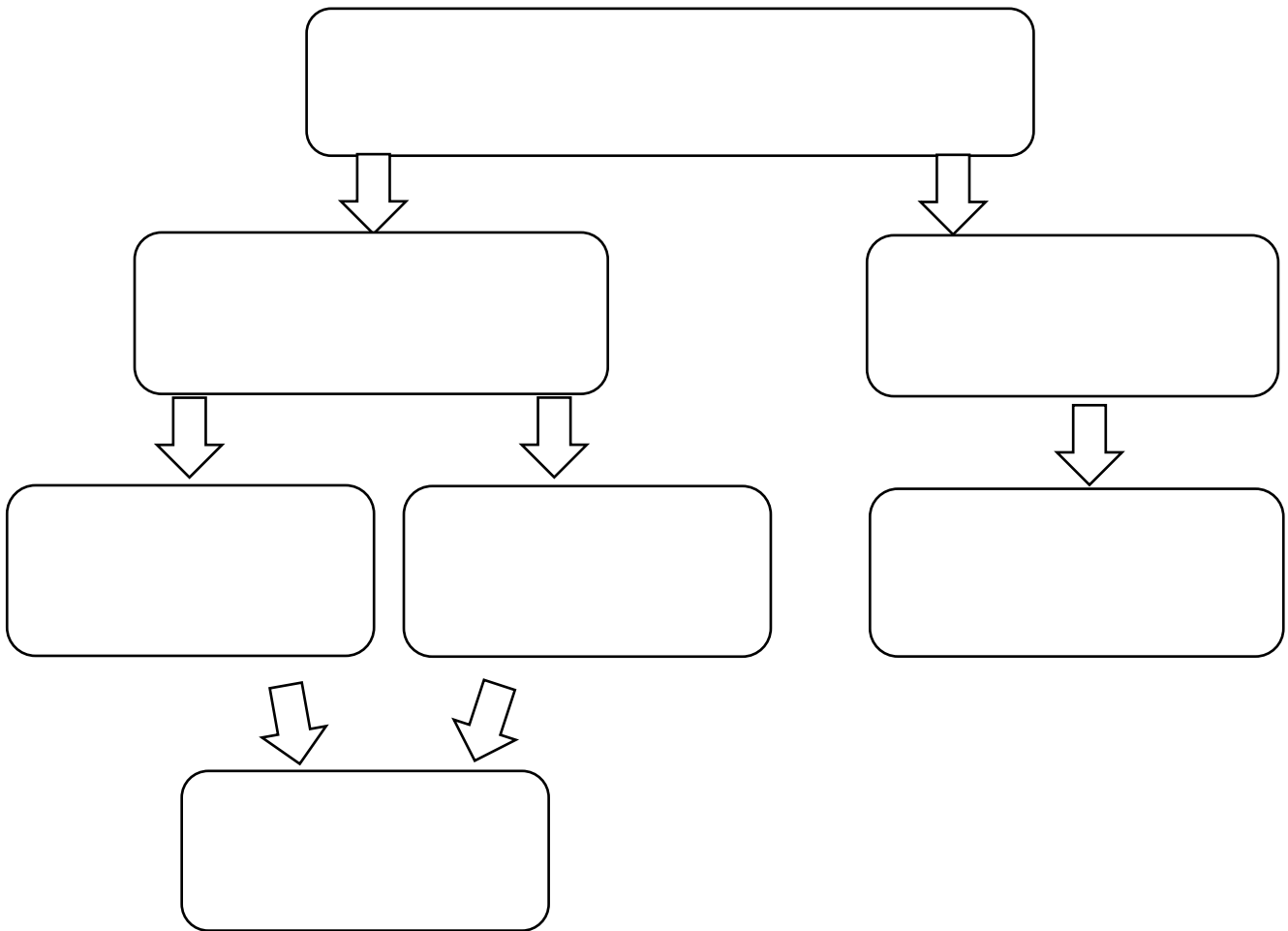
c) $\underline{\hspace{2cm}}$



6.6 Reasoning About Special Quadrilaterals

Goal: Identify special quadrilaterals based on limited information

The Quadrilateral Family Tree



A square is always a _____, _____, _____, and _____.

A rectangle is always a _____ and sometimes a _____.

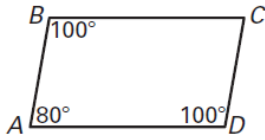
A rhombus is always a _____ and sometimes a _____.

A parallelogram is always a _____.

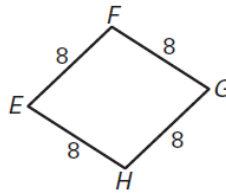
An isosceles trapezoid is always a _____ and a _____. A trapezoid is always a _____.

Determine whether the quadrilateral is a trapezoid, isosceles trapezoid, parallelogram, rectangle, rhombus, or square.

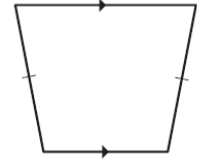
a) _____



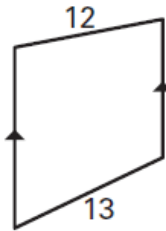
b) _____



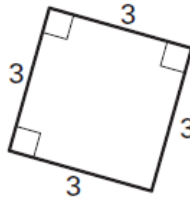
c) _____



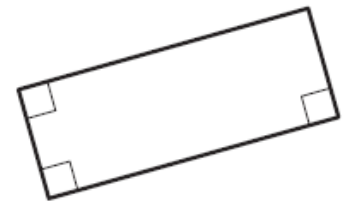
d) _____



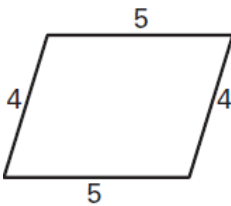
e) _____



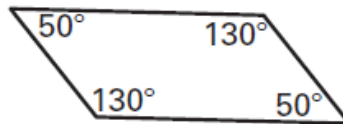
f) _____



g) _____

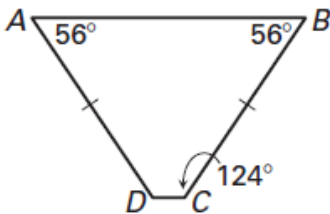


h) _____

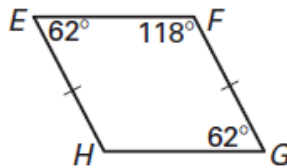


Are you given enough information to conclude that the figure is the given type of special quadrilateral? Explain your reasoning.

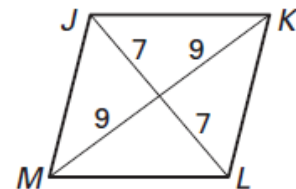
a) An isosceles trapezoid?



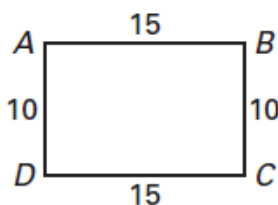
b) A rhombus?



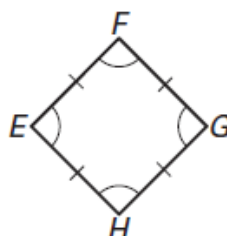
c) A parallelogram?



d) A rectangle?



e) A square?



f) A parallelogram?

