

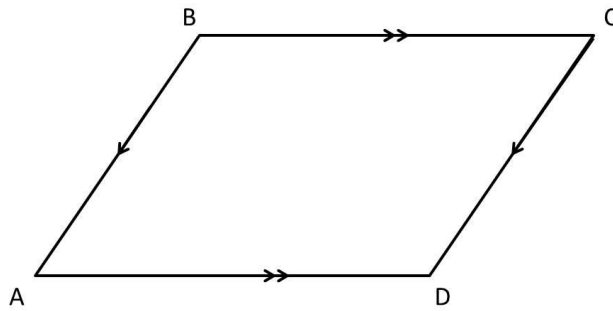
Properties of Parallelograms Notes

Quadrilateral

- Is a polygon with four sides.
- The sum of all its angles is 360 degrees.

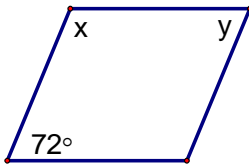
Parallelogram

- Is a special type of quadrilateral with two pairs of opposite sides that are parallel.
- Opposite angles and sides are congruent.
- Consecutive angles are supplementary.
- The diagonals are bisected with each other

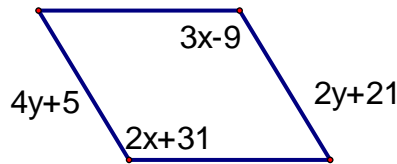


Find the missing values indicated by the variable.

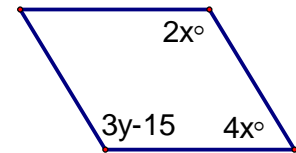
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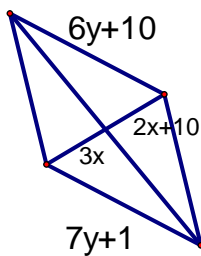
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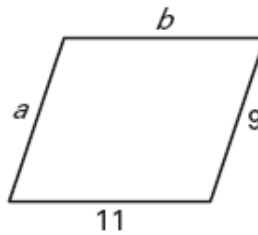
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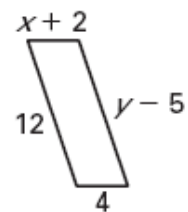
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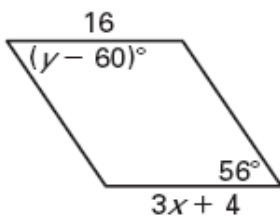
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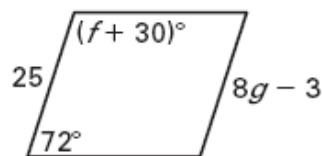
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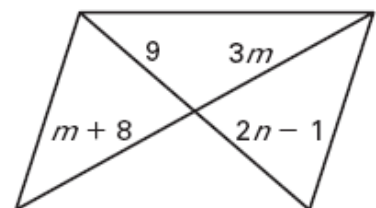
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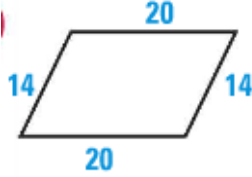
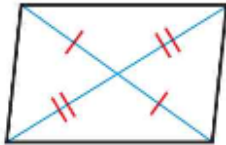
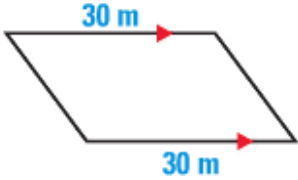
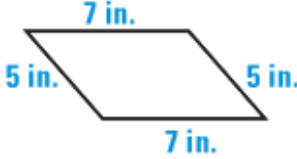
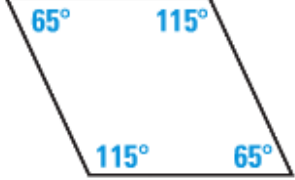
9.



Proving Parallelograms

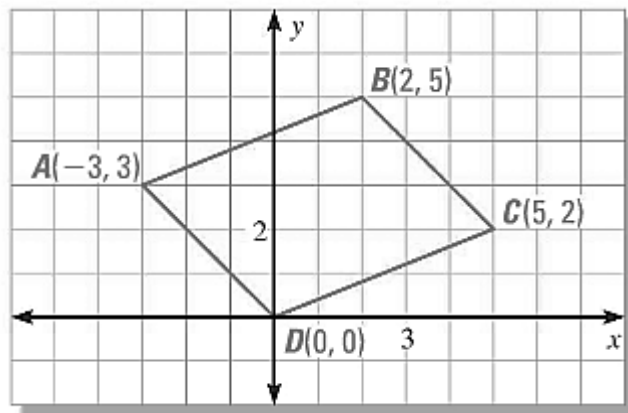
- Show that both pairs of opposite sides are parallel.
- Show that both pairs of opposite sides are congruent.
- Show that both pairs of opposite angles are congruent.
- Show that the diagonals bisect each other.
- Show that a pair of opposite sides is both parallel and congruent.

Determine if the following quadrilaterals are parallelograms. If so, state the theorem you used.

<p>1.</p> 	<p>2.</p> 	<p>3.</p> 
<p>4.</p> 	<p>5.</p> 	<p>6.</p> 

7.
 In quadrilateral $WXYZ$, $m\angle W = 42^\circ$, $m\angle X = 138^\circ$, $m\angle Y = 42^\circ$. Find $m\angle Z$.
 Is $WXYZ$ a parallelogram? *Explain* your reasoning.

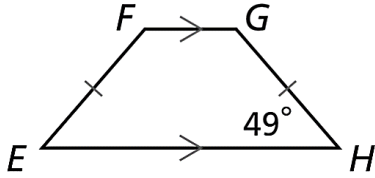
8. Prove that quadrilateral $ABCD$ is a parallelogram.



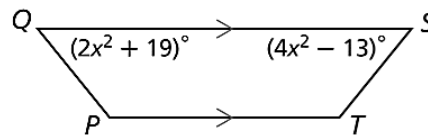
Properties Trapezoids

- Trapezoids have exactly one pair of opposite parallel sides.
- An isosceles trapezoid has a pair of opposite parallel sides **and** two congruent legs.
- The **median** is one half the sum of the bases.
- “Consecutive” angles are supplementary.

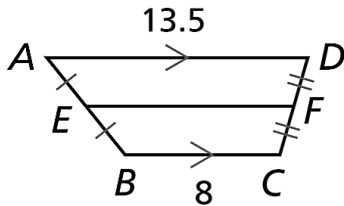
1.



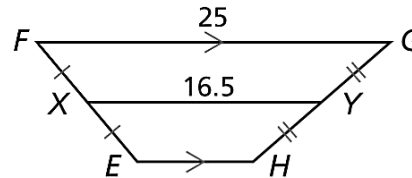
2.



3.



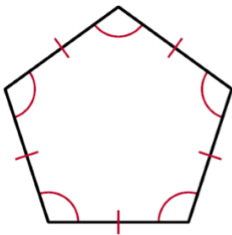
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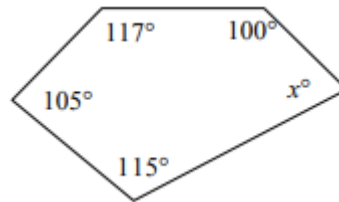
Polygons

- A regular polygon is where all sides are congruent.
- The sum of the angle measures of all convex polygons is $(n - 2)180^\circ$, where n is the number of sides.
- The sum of the exterior angle measures is 360°

1. Find the measure of one interior angle.



2. Find the value of x .



3. Find the measure of one exterior angle of the octagon below.

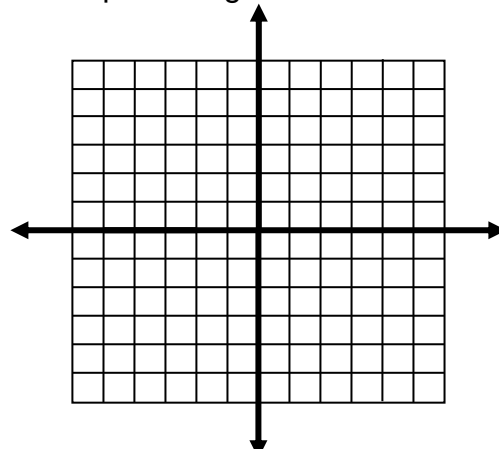


4. Find the measure of one exterior angle of the hexagon below.

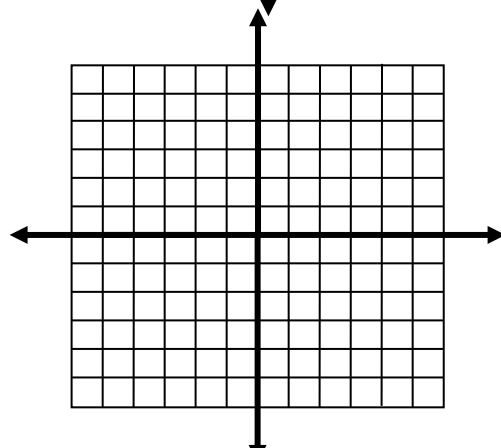


Practice Coordinate Geometry: Determine if quadrilateral PQRS is a parallelogram.

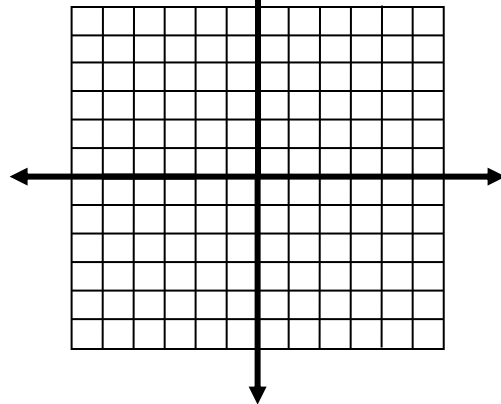
1. $P(-2,1)$, $Q(-2,3)$, $R(0,3)$, $S(0,1)$



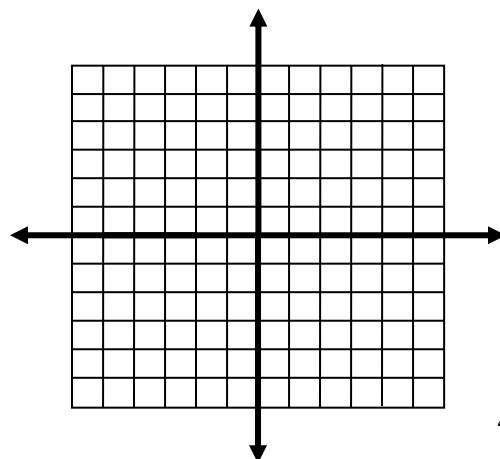
2. $P(0,0)$, $Q(0,3)$, $R(2,4)$, $S(4,2)$



3. $P(-3,0)$, $Q(-2,-4)$, $R(3,0)$, $S(2,4)$



3. $P(-3,3)$, $Q(2,2)$, $R(1,-2)$, $S(-4,-1)$



Ex1: ABCD is a parallelogram. Given $m\angle ABD = 65^\circ$, $m\angle CBD = 45^\circ$, $AE = 5$, $BC = 8$. Find the measure of the following:

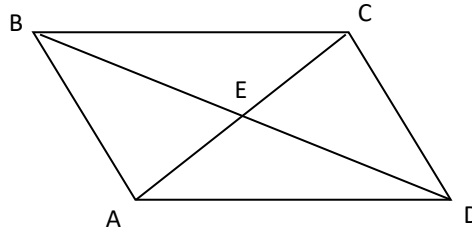
$AD = \underline{\hspace{2cm}}$

$EC = \underline{\hspace{2cm}}$

$m\angle ADC = \underline{\hspace{2cm}}$

$m\angle BCD = \underline{\hspace{2cm}}$

$m\angle BDA = \underline{\hspace{2cm}}$



Ex2: Find the indicated measure in $\square ABCD$.

12. $m\angle AEB$

13. $m\angle BAE$

14. $m\angle AED$

15. $m\angle ECB$

16. $m\angle BAD$

17. $m\angle DCE$

18. $m\angle ADC$

19. $m\angle DCB$

