

Name: _____ Date: _____ per: _____

Chapter 6 (section 2) – Day 3

Parallelograms

Homework: Worksheet

Properties of Parallelograms

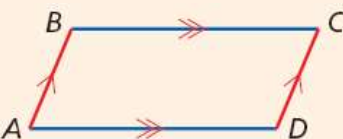
Lesson 6-2

Properties of Parallelograms

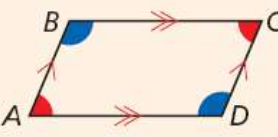
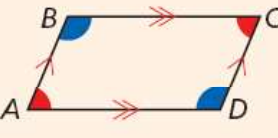
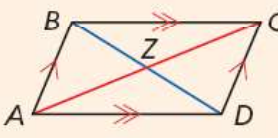
In a parallelogram,

1. The opposite sides are parallel by definition.
2. The opposite sides are congruent.
3. The opposite angles are congruent.
4. The diagonals bisect each other.
5. Any pair of consecutive angles are supplementary.
6. Each diagonal separates it into two congruent triangles.

Theorem 6-2-1 Properties of Parallelograms

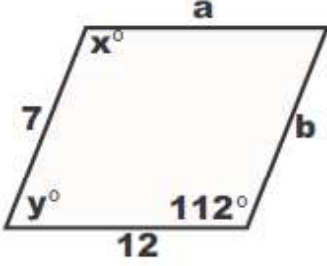
THEOREM	HYPOTHESIS	CONCLUSION
If a quadrilateral is a parallelogram, then its opposite sides are congruent. (□ → opp. sides ≅)		$\overline{AB} \cong \overline{CD}$ $\overline{BC} \cong \overline{DA}$

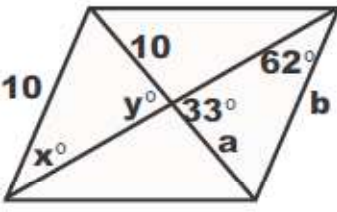
Theorems Properties of Parallelograms

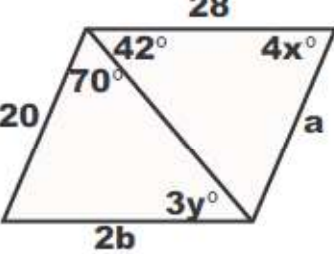
THEOREM	HYPOTHESIS	CONCLUSION
6-2-2 If a quadrilateral is a parallelogram, then its opposite angles are congruent. (□ → opp. ∠ ≅)		$\angle A \cong \angle C$ $\angle B \cong \angle D$
6-2-3 If a quadrilateral is a parallelogram, then its consecutive angles are supplementary. (□ → cons. ∠ supp.)		$m\angle A + m\angle B = 180^\circ$ $m\angle B + m\angle C = 180^\circ$ $m\angle C + m\angle D = 180^\circ$ $m\angle D + m\angle A = 180^\circ$
6-2-4 If a quadrilateral is a parallelogram, then its diagonals bisect each other. (□ → diags. bisect each other)		$\overline{AZ} \cong \overline{CZ}$ $\overline{BZ} \cong \overline{DZ}$

Level A:

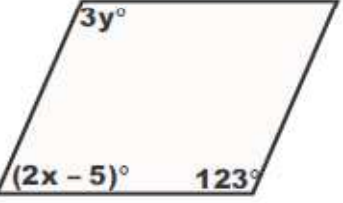
In exercises 14 – 16, each quadrilateral is a parallelogram. Find the indicated values.

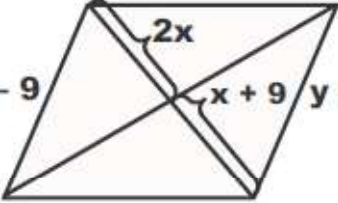
<p>14. $a =$ _____ $b =$ _____ $x =$ _____ $y =$ _____</p>	
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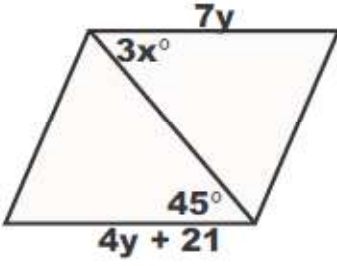
<p>15. $a =$ _____ $b =$ _____ $x =$ _____ $y =$ _____</p>	
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<p>16. $a =$ _____ $b =$ _____ $x =$ _____ $y =$ _____</p>	
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In exercises 17 – 19, what values must 'x' and 'y' have to make each quadrilateral a parallelogram?

<p>17. $x =$ _____ $y =$ _____</p>	
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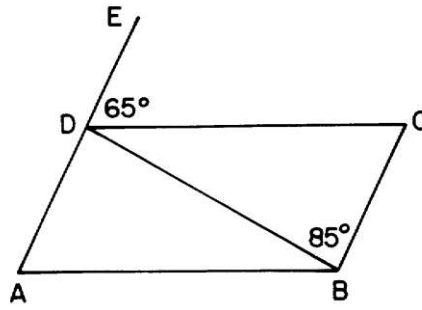
<p>18. $x =$ _____ $y =$ _____</p>	
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<p>19. $x =$ _____ $y =$ _____</p>	
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Level B

20.

In the accompanying diagram of parallelogram $ABCD$, side \overline{AD} is extended through D to E and \overline{DB} is a diagonal. If $m\angle EDC = 65$ and $m\angle CBD = 85$, find $m\angle CDB$.



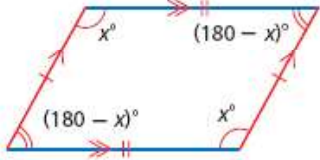
21. In parallelogram $LMNO$, an exterior angle at vertex O measures 72° . Find the measure, in degrees, of $\angle L$.

Summary

Properties of Parallelograms

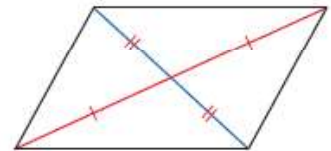
Lesson 6-2

Why? The properties of parallelograms make these figures useful in mechanics and construction.



A quadrilateral is a parallelogram \rightarrow all of these properties are true.

- Opposite sides are parallel.
- Opposite sides are congruent.
- Opposite angles are congruent.
- Consecutive angles are supplementary.
- Diagonals bisect each other.



Homework

Properties of Parallelograms

Parallelograms have all of these properties:

- both pairs of opposite sides parallel
- both pairs of opposite sides congruent
- both pairs of opposite angles congruent
- diagonals bisect each other

Shade the answers below to discover the corporation whose success is based on the invention of Chester Carlson.

1. If $CA = 10$, $EK =$ _____ .
2. If $CK = 18$, $CX =$ _____ .
3. If $\angle CEK = 85^\circ$, $\angle CAK =$ _____ .
4. If $\angle ECA = 130^\circ$, $\angle CAK =$ _____ .
5. If $\angle 1 = 40^\circ$ and $\angle 2 = 65^\circ$, $\angle EKA =$ _____ .
6. If $EX = 15$, $EA =$ _____ .
7. If $CE = 12$, $KA =$ _____ .
8. If $\angle 8 = 25^\circ$ and $\angle 7 = 35^\circ$, $\angle EKA =$ _____ .
9. If $CX = 5x - 44$ and $XK = 2x + 25$, then $x =$ _____ .
10. If $\angle 7 = 30^\circ$ and $\angle 4 = 40^\circ$, $\angle EKA =$ _____ .
11. If $CE = 3x + 5$ and $AK = 7x - 15$, then $x =$ _____ .
12. If $\angle ECA = 6x - 20$ and $\angle EKA = 2x + 80$, then $x =$ _____ .
13. If $\angle CAE = 35^\circ$, $\angle AEK =$ _____ .
14. If $\angle 2 = 100^\circ$ and $\angle 3 = 20^\circ$, $\angle CXA =$ _____ .
15. If $\angle CEK = 80^\circ$, $\angle EKA =$ _____ .
16. $\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 + \angle 7 + \angle 8 =$ _____ .

