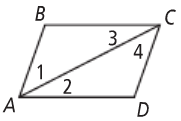
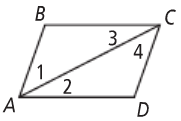
Parallelogram Proofs and Problems

**Definition:** A parallelogram is a quadrilateral with both pairs of opposite sides parallel.

**Example 1:** Given: ▭ABCD is a parallelogram.

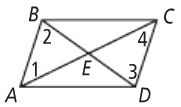
Prove: AB ≅ CD and BC ≅ DA.

|  |  |
| --- | --- |
| **Statement** | **Reason** |
| 1. ABCD is a parallelogram | 1. |
| 2. | 2. Definition of a parallelogram |
| 1. ∠1 ≅ ∠4, ∠3 ≅ ∠2 | 3. |
| 4. | 4. |
| 5. ∆ABC ≅ ∆CDA | 5. |
| 6. | 6. CPCTC |

**Example 2:** Given: ▭ABCD is a parallelogram.

Prove: ∠B ≅∠D

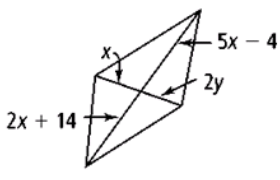
|  |  |
| --- | --- |
| **Statement** | **Reason** |
| 1. ABCD is a parallelogram | 1. |
| 2. | 2. |
|  | 3. |
| 4. | 4. |
| 5. | 5. |
| 6. | 6. |

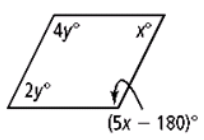
**Example 3:** Given: ▭ABCD is a parallelogram.

Prove: AC and BD bisect each other at E.

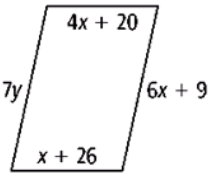
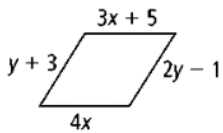
|  |  |
| --- | --- |
| **Statement** | **Reason** |
| 1. ABCD is a parallelogram | 1. Given |
| 2. | 2. |
| 3. | 3. |
| 4. | 4. |
| 5. | 5. ASA |
| 6. | 6. |
| 7. | 7. Definition of segment bisector |

|  |  |  |
| --- | --- | --- |
| Properties of Parallelograms – use when GIVEN a pg. | | |
| Sides | Definition of Parallelogram: A **parallelogram** is a quadrilateral with both pairs of opposite sides parallel. | http://www.mathplanet.com/Oldsite/media/44000/parallelogram_499x300.jpg |
| If a quadrilateral is a parallelogram,  the 2 pairs of opposite sides are congruent. | http://www.mathplanet.com/Oldsite/media/44000/parallelogram_499x300.jpg |
| Angles | If a quadrilateral is a parallelogram,  the 2 pairs of opposite angles are congruent. | http://www.mathplanet.com/Oldsite/media/44000/parallelogram_499x300.jpg |
| If a quadrilateral is a parallelogram,  the consecutive angles are supplementary. | http://www.mathplanet.com/Oldsite/media/44000/parallelogram_499x300.jpg |
| Diagonals | If a quadrilateral is a parallelogram,  the diagonals bisect each other. | http://www.mathplanet.com/Oldsite/media/44000/parallelogram_499x300.jpg |

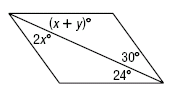
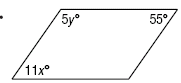
**Example 4:** For what values of x and y must each figure be a parallelogram?









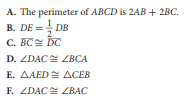
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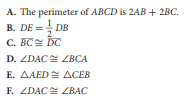


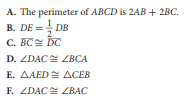
**DAY 2: HOMEWORK**

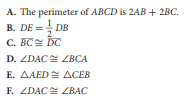
Use Parallelogram ABCD shown. Determine whether each of the statements is TRUE or FALSE. EXPLAIN your reasoning.



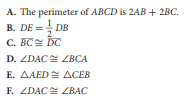
1. 

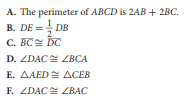


3.

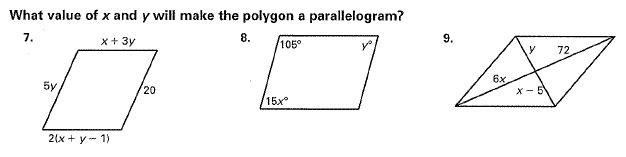


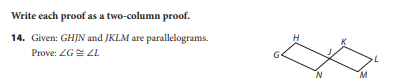
4.

5.

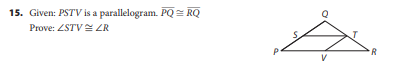


6.





|  |  |
| --- | --- |
| **Statement** | **Reason** |
|  | 1. |
| 2. | 2. |
|  | 3. |



|  |  |
| --- | --- |
| **Statement** | **Reason** |
|  | 1. |
| 2. | 2. |
|  | 3. |
| 4. | 4. |