Linear Pair Theorem

As we have already learned, a straight path always has an angle measure of 180˚. A **linear pair** is a straight path that has been broken into exactly two angles. Because these two angles together form a line, then that means the two angles together must add to equal 180˚.

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| **Given**  …means that the problem either tells you or shows you that something is true. | | | | **Linear Pair Theorem**  …means that if two angles are a linear pair, then their measures will add to equal 180˚. | | | | |
|  | | | |  |  | |  |  |
|  | Given: *x* = 2 and *AB* = 3*x* + 1  Prove: *AB* = 7 | |  |  | Given:  Prove: | | |  |
|  | *x* = 2 and *AB* = 3*x* + 1 | **GIVEN** |  |  |  | Given | |  |
|  | *AB* = 3(2) + 1 | Substitution |  |  |  |
|  | *AB* = 7 | Simplify |  |  |  | **LINEAR PAIR THM.** | |  |
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We now know the following 10 properties (as well as a few more): Reflexive, Symmetric, Substitution, Simplify, Addition Prop. of Equality, Subtraction Prop. of Equality, Multiplication Prop. of Equality, Division Prop. of Equality, **GIVEN (the setup—what’s told to you or shown to you in the problem)**, and **LINEAR PAIR THEOREM (if two angles are a linear pair, then they add to equal 180˚)**.

The proofs below will only use properties form this list of 10. Be aware that **EVERY STEP** must now have an explanation from our list of properties.

**Fill in the blanks.**

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| 1. |  |  | 2. |  |
| Given:    Prove: | |  | Given:  Prove: | |
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| 3. |  |  | 4. |  |
| Given:  Prove: | |  | Given:  Prove: | |
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| 5. |  |  | 6. |  |
| Given:  Prove: | |  | Given: ,    Prove: | |
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**Solve each problem and explain each step.**

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| 7. |  |  | 8. |  |
| Given: ,  Prove: | |  | Given:    Prove: | |
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| 9. |  |  | 10. |  |
| Given:  Prove: | |  | Given:  Prove: | |
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