Triangle Sum & Third Angles Theorems

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| Triangle Sum Theorem | Third Angles Theorem |
| The three angles of a triangle always add to equal 180˚. | SETUP: If two angles of a triangle are congruent to angles on another triangle,  RESULT: Then the third angles on these two triangles will be congruent to each other as well. |
| Example:   |  |  | | --- | --- | | Given:    Prove: | | | Statements | Reasons | |  | Triangle Sum Thm. | | Example:   |  |  | | --- | --- | | Given:    Prove: | | | Statements | Reasons | |  | Given | |  | Third Angles Thm. | |

**Fill in the proofs. Each proof was written using the triangles shown below.**

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| 1. | |  | 2. | |
| Given:    Prove: | |  | Given:    Prove: | |
| Statements | Reasons |  | Statements | Reasons |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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| 3. | |  | 4. | |
| Given:    Prove: | |  | Given:    Prove: | |
| Statements | Reasons |  | Statements | Reasons |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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| 5. | |  | 6. | |
| Given:    Prove: | |  | Given: *See above image.*    Prove: | |
| Statements | Reasons |  | Statements | Reasons |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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| 7. | |  | 8. | |
| Given:    Prove: | |  | Given:    Prove: | |
| Statements | Reasons |  | Statements | Reasons |
|  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  |  | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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**Our focus this unit has been on proofs. However, it is just as important for you to be able to solve a problem (without the proof structure). For the following problems, use what you know to determine the answer.**

Complementary & Supplementary

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| 9. and are complementary. . What is ?  (Complementary: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 90) | 10. and are supplementary. . What is ?  (Supplementary: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 180) |
| 11. and are complementary.  & .  What is ? *Find x & plug it in.*  (Complementary: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 90) | 12. and are supplementary.  & .  What is ? *Find x & plug it in.*  (Supplementary: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 180) |

Vertical Angles

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| 13. & are vertical angles. . What is the ?  (Vertical Angles: \_\_\_\_\_\_ \_\_\_\_\_\_, so \_\_\_\_\_\_ = \_\_\_\_\_\_) | 14. & are vertical angles.  & . What is ?  (Vertical Angles: \_\_\_\_\_\_ \_\_\_\_\_\_, so \_\_\_\_\_\_ = \_\_\_\_\_\_) |

Linear Pair Angles

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| 15. & are linear pair angles. . What is the ?  (Linear Pair: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 180) | 16. & are vertical angles.  & . What is ?  (Linear Pair: \_\_\_\_\_\_ + \_\_\_\_\_\_ = 180) |