Corresponding Parts of Congruent Triangles are Congruent (CPCTC)

So far, we have worked on proving that triangles are congruent. Now, we are going to look at what it means for triangles to be congruent. If triangles are congruent, then that means that every part of those triangles are the same. To be more specific, every **corresponding** (matching) part of those triangles are the same. This means that if you know triangles are the same, then you know that the parts are the same. This property is called Corresponding Parts of Congruent Triangles are Congruent, also known as **CPCTC**.

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| **Corresponding Parts of Congruent Triangles** **are Congruent (CPCTC)** |
| **Setup step:** Triangle1 is congruent to Triangle2**Resulting step:** Any part on Triangle1 is congruent to its matching part on Triangle2 |
| **Example Proofs using CPCTC** |
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| Given: $△ABC≅△DFE$ Prove: $∠A≅∠D$ |
| Statements | Reasons |
| $$△ABC≅△DFE$$ | Given |
| $$∠A≅∠D$$ | CPCTC |

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| Given: $△ABC≅△DFE$ Prove: $∠B≅∠F$ |
| Statements | Reasons |
| $$△ABC≅△DFE$$ | Given |
| $$∠B≅∠F$$ | CPCTC |

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| Given: $△ABC≅△DFE$ Prove: $∠C≅∠E$ |
| Statements | Reasons |
| $$△ABC≅△DFE$$ | Given |
| $$∠C≅∠E$$ | CPCTC |

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| Given: $△ABC≅△DFE$ Prove: $\overbar{AB}≅\overbar{DF}$ |
| Statements | Reasons |
| $$△ABC≅△DFE$$ | Given |
| $$\overbar{AB}≅\overbar{DF}$$ | CPCTC |

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| Given: $△ABC≅△DFE$ Prove: $\overbar{BC}≅\overbar{FE}$ |  | Given: $△ABC≅△DFE$ Prove: $∠B≅∠F$ |
| Statements | Reasons | Statements | Reasons |
| $$△ABC≅△DFE$$ | Given | $$△ABC≅△DFE$$ | Given |
| $$\overbar{BC}≅\overbar{FE}$$ | CPCTC | $$∠B≅∠F$$ | CPCTC |

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| Given: $△ABC≅△DFE$ Prove: $\overbar{CA}≅\overbar{ED}$ |  | Given: $△ABC≅△DFE$ Prove: $∠C≅∠E$ |
| Statements | Reasons | Statements | Reasons |
| $$△ABC≅△DFE$$ | Given | $$△ABC≅△DFE$$ | Given |
| $$\overbar{CA}≅\overbar{ED}$$ | CPCTC | $$∠C≅∠E$$ | CPCTC |

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**Fill in the proofs.**

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| 1. |  | 2. |
| Given: $△LMN≅△QRP$ Prove: $\overbar{LN}≅\overbar{QP}$ |  | Given: $△LMN≅△QRP$ Prove: $∠M≅∠R$ |
| Statements | Reasons |  | Statements | Reasons |
| $$△LMN≅△QRP$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$△LMN≅△QRP$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$\overbar{LN}≅\overbar{QP}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$∠M≅∠R$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 3. |  | 4. |
| Given:  Prove: $\overbar{AC}≅\overbar{DF}$ |  | Given:  Prove: $∠GHL≅∠JLH$ |
| Statements | Reasons |  | Statements | Reasons |
| $$\overbar{AB}≅\overbar{DE}, \overbar{BC}≅\overbar{EF}, $$$$m∠B=103˚, $$$$m∠E=103˚$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$\overbar{GL}≅\overbar{JH}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$m∠B=m∠E$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $∠G \& ∠J$ are right angles | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$∠B≅∠E$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$\overbar{HL}≅\overbar{LH}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$△ABC≅△DEF$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$△HGL≅△LJH$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$\overbar{AC}≅\overbar{DF}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$∠GHL≅∠JLH$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 5. |  | 6. |
| Given: $P$ is the midpoint of $\overbar{MQ}$ Prove: $\overbar{NP}≅\overbar{KP}$ |  | Given: $m∠T=124˚$ Prove: $m∠R=124˚$ |
| Statements | Reasons |  | Statements | Reasons |
| $$\overbar{MN}||\overbar{QK}, ∠MPN \& ∠QPK$$are vertical angles, and $P$ is the midpoint of $\overbar{MQ}$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$\overbar{SV}≅\overbar{VS}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $∠M \& ∠Q$ are alt. int. $∠$s | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$\overbar{SR}≅\overbar{ST}, \overbar{RV}≅\overbar{TV}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$∠M≅∠Q$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$△SRV≅△STV$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$∠MPN≅∠QPK$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$∠R≅∠T$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$\overbar{MP}≅\overbar{QP}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$m∠T=124˚$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$△MPN≅△QPK$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$m∠R=m∠T$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| $$\overbar{NP}≅\overbar{KP}$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | $$m∠R=124˚$$ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| 7. |  | 8. |
| Given:  Prove: $\overbar{WY}≅\overbar{BC}$ |  | Given:   Prove: $∠DEG≅∠FEG$ |
| Statements | Reasons |  | Statements | Reasons |
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