Linear Pair Proof Practice

The properties that you know are:

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| Reflexive Property of Equality | Substitution Property of Equality | Addition Property of Equality | Multiplication Property of Equality | Given |
| Symmetric Property of Equality | Simplify | Subtraction Property of Equality, | Division Property of Equality | Linear Pair Theorem |

Explain every step of each proof below, using the 10 properties listed above.

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| 1. |  |  | 2. |  |
| Given: $∠LMN \& ∠NMP are a linear pair$Prove: $m∠LMN+m∠NMP=180˚$ |  | Given: Prove: $m∠PQS+m∠SQR=180˚$ |
| $$∠LMN \& ∠NMP are $$$$a linear pair$$ |  |  | $$∠PQS \& ∠SQR are $$$$a linear pair$$ |  |
| $$m∠LMN+m∠NMP=180˚$$ |  |  | $$m∠PQS+m∠SQR=180˚$$ |  |

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| 3. |  |  | 4. |  |
| Given: Prove: $m∠CDE=96˚$ |  | Given: $∠FGH \& ∠HGJ are a linear pair$ $m∠HGJ=38˚$Prove: $m∠FGH=142˚$ |
| $∠BDC \& ∠CDE$ area linear pair |  |  | $$m∠FGH=38˚$$ |  |
| $$m∠BDC=84˚$$ |  |  | $∠FGH \& ∠HGJ$ area linear pair |  |
| $$m∠BDC+m∠CDE=180˚$$ |  |  | $$m∠FGH+m∠HGJ=180˚$$ |  |
| $$\left(84\right)˚+m∠CDE=180˚$$ |  |  | $$\left(38\right)˚+m∠FGH=180˚$$ |  |
| $$m∠CDE=96˚$$ |  |  | $$m∠FGH=142˚$$ |  |

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| 5. |  |  | 6. |  |
| Given: $∠1 \& ∠2$ are a linear pair. $m∠1=\left(2x\right)˚$ Prove: $m∠2=180˚-\left(2x\right)˚$ |  | Given: $∠G \& ∠H$ are a linear pair. $m∠G=m∠H$ Prove: $m∠H=90˚$ |
| $∠1 \& ∠2$ are a linear pair. $m∠1=\left(2x+1\right)˚$ |  |  | $∠G \& ∠H$ are a linear pair. $m∠G=m∠H$ |  |
| $$m∠1+m∠2=180˚$$ |  |  | $$m∠G+m∠H=90˚$$ |  |
| $$\left(2x\right)˚+m∠2=180˚$$ |  |  | $$m∠H+m∠H=180˚$$ |  |
| $$m∠2=180˚-\left(2x\right)˚$$ |  |  | $$2(m∠H)=180˚$$ |  |
|  |  |  | $$m∠H=90˚$$ |  |

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| 7. |  |  | 8. |  |
| Given: Prove: $m∠NEY=39˚$ |  | Given: Prove: $m∠MIN=90˚$ |
| $∠DEN \& ∠NEY$ are a linear pair |  |  | $$m∠MIN=\left(2x+6\right)˚$$$$m∠NIE=\left(2x+6\right)˚$$ |  |
| $$m∠DEN+m∠NEY=180˚$$ |  |  | $∠MIN \& ∠NIE$ area linear pair |  |
| $$m∠DEN=\left(2x+53\right)˚$$$$m∠NEY=\left(x-5\right)˚$$ |  |  | $$m∠MIN+m∠NIE=180˚$$ |  |
| $$\left(2x+53\right)˚+\left(x-5\right)˚=180˚$$ |  |  | $$\left(2x+6\right)˚+\left(2x+6\right)˚=180˚$$ |  |
| $$\left(3x+48\right)˚=180˚$$ |  |  | $$\left(4x+12\right)˚=180˚$$ |  |
| $$\left(3x\right)˚=132˚$$ |  |  | $$\left(4x\right)˚=168˚$$ |  |
| $$x=44$$ |  |  | $$x=42$$ |  |
| $$m∠NEY=\left((44)-5\right)˚$$ |  |  | $$m∠MIN=\left(2\left(42\right)+6\right)˚$$ |  |
| $$m∠NEY=39˚$$ |  |  | $$m∠MIN=90˚$$ |  |