You know how to solve these kinds of problems. Now, I expect you to explain how you solve them. Your work is to fill in the blanks explaining **how I got to each step (never explain ahead of the step you’re on).**

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| **Problem #1**Given: Prove: $m∠3=136˚$

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| **Statements** | **Reasons** |
| 1. $∠1 \& ∠3$ are vertical angles, $m∠1=\left(4x+16\right)˚$ & $m∠3=\left(5x-14\right)˚$ | 1.  |
| 2. $∠1≅∠3$ | 2.  |
| 3. $m∠1=m∠3$ | 3.  |
| 4. $4x+16=5x-14$ | 4.  |
| 5. $16=x-14$ | 5.  |
| 6. $30=x$ | 6.  |
| 7. $x=30$ | 7.  |
| 8. $m∠3 =5\left(30\right)-14$ | 8.  |
| 9. $m∠3=136˚$ | 9.  |

 | **Problem #2:** Given: Prove:$ m∠6=29˚$

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| **Statements** | **Reasons** |
| 1. $∠6 \& ∠8$ are vertical angles, $m∠6=\left(7x+22\right)˚$ & $m∠8=\left(12x+17\right)˚$ | 1.  |
| 2. $∠6≅∠8$ | 2.  |
| 3. $m∠6=m∠8$ | 3.  |
| 4. $7x+22=12x+17$ | 4.  |
| 5. $22=5x+17$ | 5.  |
| 6. $5=5x$ | 6.  |
| 7. $1=x$ | 7.  |
| 8. $x=1$ | 8.  |
| 9. $m∠6=7\left(1\right)+22$ | 9.  |
| 10. $m∠6=29˚$ | 10. |

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| **Problem #3:** Given: Prove: $m∠11=20˚$

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| **Statements** | **Reasons** |
| 1. $∠10 \& ∠11$ are a linear pair, $m∠10=\left(8x+24\right)˚$ & $m∠11=\left(x+3\right)˚$ | 1.  |
| 2. $m∠10+m∠11=180$ | 2.  |
| 3. $8x+24+x+3=180$ | 3.  |
| 4. $9x+27=180$ | 4.  |
| 5. $9x=153$ | 5.  |
| 6. $x=17$ | 6.  |
| 7. $m∠11=17+3$ | 7.  |
| 8. $m∠11=20˚$ | 8.  |

 | **Problem #4:** Given:Prove: $m∠14=154˚$

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| **Statements** | **Reasons** |
| 1. $∠13 \& ∠14$ are a linear pair, $m∠13=\left(4x-14\right)˚$ & $m∠14=\left(15x+4\right)˚$ | 1.  |
| 2. $m∠13+m∠14=180$ | 2.  |
| 3.$ \left(4x-14\right)+\left(15x+4\right)=180$ | 3.  |
| 4. $19x-10=180$ | 4.  |
| 5. $19x=190$ | 5.  |
| 6. $x=10$ | 6.  |
| 7. $m∠14=15\left(10\right)+4$ | 7.  |
| 8. $m∠14=154˚$ | 8.  |

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| **Problem #5:** Given: $m∠5=\left(9x+5\right)˚, m∠8=\left(7x+11\right)˚$&$ p∥r$Prove: $m∠8=32˚$

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| **Statements** | **Reasons** |
| 1. $∠5 \& ∠8$ are alternate exterior angles &$ p∥r$  | 1.  |
| 2. $∠5≅∠8$ | 2.  |
| 3. $m∠5=m∠8$ | 3.  |
| 4. $m∠5=\left(9x+5\right)˚$ & $m∠8=\left(7x+11\right)˚$ | 4.  |
| 5. $9x+5=7x+11$ | 5.  |
| 6. $2x+5=11$ | 6.  |
| 7. $2x=6$ | 7.  |
| 8. $x=3$ | 8.  |
| 9. $m∠8=7\left(3\right)+11$ | 9. |
| 10. $m∠8=32˚$ | 10. |

 | **Problem #6:** Given: $ m∠4=\left(3x+15\right)˚, m∠2=\left(5x+1\right)˚$&$ x=7$Prove: $p∥r$

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| **Statements** | **Reasons** |
| 1. $m∠4=\left(3x+15\right)˚$,$m∠2=\left(5x+1\right)˚$&$ x=7$ | 1.  |
| 2. $m∠4=3\left(7\right)+15$ | 2.  |
| 3. $m∠4=36$ | 3.  |
| 4. $m∠2=5\left(7\right)+1$ | 4.  |
| 5. $m∠2=36$ | 5.  |
| 6. $36=36$ | 6.  |
| 7. $m∠4=m∠2$ | 7.  |
| 8. $∠4≅∠2$ | 8.  |
| 9. $∠4 \& ∠2$ are corresponding angles | 9. |
| 10. $p∥r$ | 10. |

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| **Problem #7:** Given: $m∠6=55˚, m∠3=125˚$Prove: $p∥r$

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| **Statements** | **Reasons** |
| 1. $∠6 \& ∠3$ are same side interior angles  | 1.  |
| 2. $$m∠6+m∠3=m∠6+m∠3$$ | 2.  |
| 3. $$m∠6+m∠3=55+125$$ | 3.  |
| 4. $m∠6+m∠3=180˚$ | 4.  |
| 5. $p∥r$ | 5. |

 | **Problem #8:** Given: $ m∠3=\left(4x\right)˚, m∠4=\left(3x+20\right)˚$&$ p∥r$Prove: $x=20$

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| **Statements** | **Reasons** |
| 1. $m∠3=\left(4x\right)˚, $$m∠4=\left(3x+20\right)˚ $&$ p∥r$ | 1.  |
| 2. $∠3 \& ∠4$ are alternate interior angles | 2.  |
| 3. $∠3≅∠4$ | 3.  |
| 4. $m∠3=m∠4$ | 4.  |
| 5. $5x=3x+20$ | 5. |
| 6. $x=20$ | 6. |

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