

Algebraic Proofs Task Cards  
Answer Sheet

Name Key  
Date \_\_\_\_\_

1. Given:  $2(a+1) = -6$   
Prove:  $a = -4$

Statements	Reasons
① $2(a+1) = -6$	① Given
② $2a+2 = -6$	② Distributive Prop.
③ $2a = -8$	③ Subtraction
④ $a = -4$	④ Division

2. Given:  $\angle 1$  &  $\angle 2$  form a linear pair,  $\angle 2$  &  $\angle 3$  are Supplementary  
Prove:  $\angle 1 \cong \angle 3$

Statements	Reasons
① $\angle 1$ & $\angle 2$ form a linear pair $\angle 2$ & $\angle 3$ are supplementary	① Given
② $\angle 1 + \angle 2 = 180$	② Def. of Linear pair
③ $\angle 2 + \angle 3 = 180$	③ Def. of Supplementary
④ $\angle 1 + \angle 2 = \angle 2 + \angle 3$	④ Substitution
⑤ $\angle 1 = \angle 3$	⑤ Subtraction
⑥ $\angle 1 \cong \angle 3$	⑥ Def. of $\cong \angle$ 's

3. Given:  $5x - 18 = 3x + 2$   
Prove:  $x = 10$

Statements	Reasons
① $5x - 18 = 3x + 2$	① Given
② $2x - 18 = 2$	② Subtraction
③ $2x = 20$	③ Addition
④ $x = 10$	④ Division

4. Given: Q is the midpoint of PR,  $PQ = 4x - 1$ ,  $QR = 9x - 14$

Prove:  $PR = 18.8$

Statements	Reasons
① Q is midpt. of PR, $PQ = 4x - 1$ , $QR = 9x - 14$	① Given
② $PQ = RQ$	② Def. of midpoint
③ $4x - 1 = 9x - 14$	③ Substitution
④ $-1 = 5x - 14$	④ Subtraction
⑤ $13 = 5x$	⑤ Addition
⑥ $x = \frac{13}{5}$	⑥ Division
⑦ $PQ = 9.4$ , $QR = 9.4$	⑦ Substitution
⑧ $PR = 18.8$	⑧ Segment addition

5. Given:  $m\angle xyw = 90$ ,  $m\angle 1 = 4x + 5$   
 $m\angle 2 = x - 3$   
Prove:  $m\angle 1 = 75.4$

Statements	Reasons
① $m\angle xyw = 90$ , $m\angle 1 = 4x + 5$ , $m\angle 2 = x - 3$	① Given
② $\angle xyw = \angle 1 + \angle 2$	② Angle Addition
③ $4x + 5 + x - 3 = 90$	③ Substitution
④ $5x + 2 = 90$	④ Simplify
⑤ $5x = 88$	⑤ Subtraction
⑥ $x = \frac{88}{5}$	⑥ Division
⑦ $m\angle 1 = 75.4$	⑦ Substitution

6. Given:  $3x - 2 = x - 8$

Prove:  $x = -3$

Statements	Reasons
① $3x - 2 = x - 8$	① Given
② $2x - 2 = -8$	② Subtraction
③ $2x = -6$	③ Addition
④ $x = -3$	④ Division

7. Given:  $3x - 4 = \frac{1}{2}x + 6$

Prove:  $x = 4$

Statements	Reasons
① $3x - 4 = \frac{1}{2}x + 6$	① Given
② $2.5x - 4 = 6$	② Subtraction
③ $2.5x = 10$	③ Addition
④ $x = 4$	④ Division

8. Given:  $\angle 2 \cong \angle 3$

Prove:  $\angle 1 \cong \angle 4$

Statements	Reasons
① $\angle 2 \cong \angle 3$	① Given
② $\angle 1 \cong \angle 2$	② Vertical $\angle$ 's
③ $\angle 1 \cong \angle 3$	③ Transitive
④ $\angle 3 \cong \angle 4$	④ Vertical $\angle$ 's
⑤ $\angle 1 \cong \angle 4$	⑤ Transitive

9. Given:  $m\angle PQR = x - 5$ ,  $m\angle SQR = x - 11$ ,  $m\angle PQS = 100$

Prove:  $x = 58$

Statements	Reasons
① $m\angle PQR = x - 5$ , $m\angle SQR = x - 11$ , $m\angle PQS = 100$	① Given
② $m\angle PQR + m\angle RQS = m\angle PQS$	② Angle Addition
③ $x - 5 + x - 11 = 100$	③ Substitution
④ $2x - 16 = 100$	④ Simplify
⑤ $2x = 116$	⑤ Addition
⑥ $x = 58$	⑥ Division

