Name: _____ **Hour:** _____ **Algebraic Proofs ws**

1-3. Fill in the blanks to complete each proof.

1. **Given:** $8x - 5 = 2x + 1$
Prove: $x = 1$
Proof:

Statements	Reasons
a. $8x - 5 = 2x + 1$	**a.** _____
b. $8x - 5 - 2x = 2x + 1 - 2x$	**b.** _____
c. _____	**c.** Substitution Property
d. _____	**d.** Addition Property
e. $6x = 6$	**e.** _____
f. $\frac{6x}{6} = \frac{6}{6}$	**f.** _____
g. _____	**g.** _____

2. **Given:** $\frac{4x + 6}{2} = 9$
Prove: $x = 3$
Proof:

Statements	Reasons
a. $\frac{4x + 6}{2} = 9$	**a.** _____
b. $\left(\frac{4x + 6}{2}\right) = 2(9)$	**b.** Mult. Prop.
c. $4x + 6 = 18$	**c.** _____
d. $4x + 6 - 6 = 18 - 6$	**d.** _____
e. $4x =$ _____	**e.** Substitution
f. $\frac{4x}{4} =$ _____	**f.** Div. Prop.
g. _____	**g.** Substitution

3. **Given:** $4x + 8 = x + 2$
Prove: $x = -2$
Proof:

Statements	Reasons
a. $4x + 8 = x + 2$	**a.** _____
b. $4x + 8 - x = x + 2 - x$	**b.** _____
c. $3x + 8 = 2$	**c.** Substitution
d. _____	**d.** Subtr. Prop.
e. _____	**e.** Substitution
f. $\frac{3x}{3} = \frac{-6}{3}$	**f.** _____
g. _____	**g.** Substitution

4-7. Give the reason for each statement in the following two-column proof.

4. Given: $3x+6=7x-2$
Prove: $x=2$

Statements	Reasons
1. $3x+6=7x-2$	1. _____
2. $6=4x-2$	2. _____
3. $8=4x$	3. _____
4. $2=x$	4. _____
5. $x=2$	5. _____

5. Given: $2-6x+4=3x-14+x$
Prove: $x=2$

Statements	Reasons
1. $2-6x+4=3x-14+x$	1. _____
2. $6-6x=3x-14+x$	2. _____
3. $6-6x=4x-14$	3. _____
4. $6=10x-14$	4. _____
5. $20=10x$	5. _____
6. $2=x$	6. _____
7. $x=2$	7. _____

6. Given: $\frac{1}{4}x+7y=10-y$

Prove: $x=40-32y$

Statements	Reasons
1. $\frac{1}{4}x+7y=10-y$	1. _____
2. $\frac{1}{4}x+7y-7y=10-y-7y$	2. _____
3. $\frac{1}{4}x=10-8y$	3. _____
4. $4\left(\frac{1}{4}x\right)=4(10-8y)$	4. _____
5. $x=4(10-8y)$	5. _____
6. $x=40-32y$	6. _____

7. Given: $5(n-3)=4(2n-7)-14$

Prove: $n=9$

Statements	Reasons
1. $5(n-3)=4(2n-7)-14$	1. _____
2. $5n-15=8n-28-14$	2. _____
3. $5n-15=8n-42$	3. _____
4. $5n-15+15=8n-42+15$	4. _____
5. $5n=8n-27$	5. _____
6. $5n-8n=8n-27-8n$	6. _____
7. $-3n=-27$	7. _____
8. $\frac{-3n}{-3}=\frac{-27}{-3}$	8. _____
9. n=9	9. _____

8-10. Complete each proof

8. Given: $4-7x=2x-23$

Prove: $x=3$

Statements	Reasons

9. Given: $\frac{1}{2}x+6y=8-3y$

Prove: $x=16-18y$

Statements	Reasons

10. Given: $-(n-5)=2(3n-8)-7$

Prove: $n=4$

Statements	Reasons