Algebraic Proofs Hw Section 2.2

Support each conclusion with a valid reason.

1. Given: $x - 42 = 12$

Conclusion: $x = 54$

Addition PoE for ≅

2. Given: $23(2 + x) = 230$

Conclusion: $2 + x = 10$

Div'n PoE for ≅

3. Given: $3x - 7x = 20$

Conclusion: $-4x = 20°$

Substitution PoE for ≅

4. Given: $-x = 34$

Conclusion: $x = -34$

Mult PoE for ≅

5. If $12 = d$ and $d = x$,

then $12 = x$.

Transitive PoE for ≅

6. $GH = GH$

Reflexive PoE for ≅

Fill in the missing statements or reasons for the following two-column proof.

Proof #1

Given: $4x - 20 = 100$ Prove: $x = 30$

Statement	Reason
1. $4x - 20 = 100$	1. Given
2. $4x = 120$	2. Add'n PoE for ≅
3. $x = 30$	3. Div'n PoE for ≅

Proof #2

Given: $12 - x = 10$ Prove: $x = 2$

Statement	Reason
1. $12 - x = 10$	1. Given PoE for ≅
2. $-x = -2$	2. Subtr. PoE for ≅
3. $x = 2$	3. Div'n PoE for ≅

Proof #3

Given: $5x + 20 = 20 + -2x$ Prove: $x = 0$

Statement	Reason
1. $5x + 20 = 20 + -2x$	1. Given
2. $5x = -2x$	2. Subtr. PoE for ≅
3. $7x = 0$	3. Add'n PoE for ≅
4. $x = 0$	4. Div'n PoE for ≅

Proof #4

Given: $12 - x = 10$ Prove: $x = 2$

Statement	Reason
1. $12 - x = 10$	1. Given
2. $12 = 10 + x$	2. Add'n PoE for ≅
3. $2 = x$	3. Subtr. PoE for ≅
4. $x = 2$	4. Symmetric PoE for ≅

Proof #5.

Given: $10 - 3(4x - 2) + 1 = 77$ Prove: $x = -5$

Statement	Reason
1. $10 - 3(4x-2)+1 = 77$	1. Given
2. $-3(4x - 2) + 1 = 67$	2. Subtr. PoE for $\mathbb{R}$
3. $-3(4x - 2) = 66$	3. Subtr. PoE for $\mathbb{R}$
4. $-12x + 6 = 66$	4. Dist. PoE for $\mathbb{R}$
5. $-12x = 60$	5. Subtr. PoE for $\mathbb{R}$
6. $x = -5$	6. Div'n PoE for $\mathbb{R}$

Proof #6. Prove that if $\frac{8}{3}x + \frac{1}{3} = \frac{11}{3}x - \frac{2}{3}$, then x = 1.

Given: $\frac{8}{3}x + \frac{1}{3} = \frac{11}{3}x - \frac{2}{3}$

Prove: $x = 1$

Statement	Reason
a. $\frac{8}{3}x + \frac{1}{3} = \frac{11}{3}x - \frac{2}{3}$	a. Given
b. $8x + 1 = 11x - 2$	b. Mult PoE for $\mathbb{R}$
c. $1 = 3x - 2$	c. Subtr'n PoE for $\mathbb{R}$
d. $3 = 3x$	d. Add'n PoE for $\mathbb{R}$
e. $1 = x$	e. Div'n PoE for $\mathbb{R}$
f. $x = 1$	f. Symmetric PoE for $\mathbb{R}$