

# Algebraic Proofs Classwork

Instructions: Complete the two-column proofs by giving a reason for each step.

1) Given:  $6 + \frac{1}{2}(8x - 22) = -33$

Statements	Reasons
1) $6 + \frac{1}{2}(8x - 22) = -33$	1) Given
2) $\frac{1}{2}(8x - 22) = -39$	2)
3) $4x - 11 = -39$	3)
4) $4x = -28$	4)
5) $x = -7$	5)

2) Given:  $2x + \frac{2}{3}(-6x - 12) = 6 + 16x - 8$

Statements	Reasons
1) $2x + \frac{2}{3}(-6x - 12) = 6 + 16x - 8$	1) Given
2) $2x + \frac{2}{3}(-6x - 12) = -2 + 16x$	2)
3) $\frac{2}{3}(-6x - 12) = -2 + 14x$	3)
4) $-4x - 8 = -2 + 14x$	4)
5) $-18x - 8 = -2$	5)
6) $-18x = 6$	6)
7) $x = -6/18$	7)
8) $x = -1/3$	8)

Instructions: Solve each equation. Show all of your steps, and give a reason for each step. If your answer is a fraction, write it in simplest form.

3) Given:  $5x - 10 + 4x = \frac{2(5x - 1)}{4}$

Statements	Reasons
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)
6)	6)
7)	7)
8)	8)

4) Given:  $2x - 7(5x - 4) = 3x - 4(8x + 1)$

Statements	Reasons
1) $2x - 7(5x - 4) = 3x - 4(8x + 1)$	1)
2)	2) Distributive Property of Equality
3) $-33x + 28 = -29x - 4$	3)
4)	4)
5)	5)
6) $x = 8$	6) Division Property of Equality

5) Given:  $5x + \frac{3}{4}(20x - 36) = 78$

Statements	Reasons
1)	1)
2)	2)
3)	3) Combine Like Terms
4) $20x = 100$	4)
5)	5)

*Challenge:* Solve each equation. Show all of your steps, and give a reason for each step. If your answer is a fraction, write it in simplest form.

6) Given:  $\frac{4x - 5}{10} = \frac{3x + 10}{4}$

Statements	Reasons
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)
6)	6)
7)	7)

7) Given:  $\frac{4x}{5} = \frac{x - 7}{8}$

Statements	Reasons
1)	1)
2)	2)
3)	3)
4)	4)
5)	5)