Practical Maths for Plumbing & Heating Students and Apprentices

Unit 8: Algebra for Plumbing and Heating Learners

Worksheet 8.

This practice set is based on **Unit 8 Algebra for Plumbing and Heating Learners** and is designed for the plumbers maths book. It focuses on simplifying algebraic expressions, expanding brackets, transposing formulae, and solving practical plumbing and heating problems using algebra.

Coverage

This practice set reflects the main Unit 8 themes used in plumbing and heating maths, including using algebraic symbols correctly, collecting like terms, expanding single and double brackets, rearranging formulae, and applying algebra to flow, pressure, power, energy, and volume calculations.

Practice Questions

Set A Simplifying expressions

1. Simplify 4a + 6a.
2. Simplify 9x - 2x.
3. Simplify 3b + 5b - 2b.
4. Simplify 7y + y - 3y.
5. Simplify 2a + 4b + 3a - b.

Set B Expanding brackets

6. Expand $2(x + 5)$.
7. Expand $3(2a + b)$.
8. Expand $-4(x - 2y)$.
9. Expand $(x + 1)(x + 4)$.
10. Expand $(2a + 1)(a + 2)$.

Set C Transposition

11. Make t the subject of $E = Pt$.
12. Make A the subject of $p = F/A$.
13. Make V the subject of $Q = V/t$.
14. Make h the subject of $V = lwh$.
15. Make P the subject of $E = Pt$.

Set D Practical problems

16. A flow of 18 L/min runs for 5 minutes. Find the volume delivered.
17. A heater uses 12 kWh over 4 hours. Find the power.
18. A pressure of 20000 Pa acts over an area of 0.5 m^2. Find the force.
19. A tank has volume 2 m^3, width 1 m, and height 1 m. Find the length.
20. A volume of 90 litres is delivered at 15 L/min. Find the time.

Set E Extra algebra practice

21. Simplify $8x - 3y + 2x + 5y - 4x$.
22. Expand $6(-x + 2y)$.
23. Expand $(x - 5)(x - 2)$.
24. Make F the subject of $p = F/A$.

25. Make E the subject of P = E/t.

Set F Applied plumbing and heating formulae

26. A system flows at 10 L/min and delivers 50 litres. Find the time.

27. A heater rated at 3 kW runs for 4 hours. Find the energy used.

28. A force of 300 N acts on an area of 0.02 m^2. Find the pressure.

29. Rearrange V = Al to make l the subject.

30. Rearrange Q = V/t to make t the subject.