

GCSE MATHEMATICS - HIGHER TIER

Linear Equations

Exam-Style Assignment

STUDENT DETAILS

Name: _____

Date: _____ Target grade / level: _____

ASSIGNMENT FOCUS

- Solve linear equations, including unknowns on both sides and brackets
- Solve equations containing fractions and decimals
- Form equations from geometry and real-life contexts
- Explain errors and justify algebraic reasoning
- Higher-tier challenge questions with multi-step algebra

Section A - Core Fluency

Solve each equation. Show every stage of your working.

- 1.** Solve $7x - 13 = 36$ **[2 marks]**

- 2.** Solve $5x + 11 = 3x + 27$ **[2 marks]**

- 3.** Solve $4(2x - 3) = 3x + 18$ **[3 marks]**

- 4.** Solve $3(2x + 5) - 4 = 5(x + 2) + 7$ **[3 marks]**

Section A - Core Fluency (continued)

5. Solve $(3x - 5) / 4 = (x + 7) / 2$ [3 marks]

6. Solve $(2x + 1) / 3 - (x - 2) / 4 = 5$ [4 marks]

7. Solve $0.4x + 1.8 = 0.7x - 0.9$ [3 marks]

8. Solve $3 - (2x - 1) / 5 = (x + 7) / 10$ [4 marks]

Section B - Forming Equations

Form an equation first, then solve it and interpret your answer.

- 9.** A rectangle has length $(3x + 4)$ cm and width $(x + 2)$ cm. Its perimeter is 52 cm. Find x and hence find the length and width of the rectangle. **[4 marks]**

- 10.** The three sides of a triangle are $(x + 7)$ cm, $(2x - 1)$ cm and $(3x - 6)$ cm. The perimeter is 72 cm. Find the length of each side. **[4 marks]**

- 11.** Three consecutive integers have a total of 93. Form an equation and find the three integers. **[3 marks]**

Section B - Forming Equations (continued)

- 12.** A taxi fare is made up of a fixed charge of £4.50 plus £1.80 for each mile travelled. A journey costs £20.70. How many miles was the journey? **[3 marks]**

- 13.** Two adjacent angles on a straight line are $(5x + 8)^\circ$ and $(3x - 4)^\circ$. Find x and the size of both angles. **[4 marks]**

- 14.** An isosceles triangle has two equal sides of length $(4x - 3)$ cm and a base of length $(2x + 5)$ cm. Its perimeter is 69 cm. Find x and the three side lengths. **[4 marks]**

Section C - Higher Reasoning & Problem Solving

These questions require explanation, modelling or more than one algebraic step.

- 15.** A student solves $5(2x - 3) = 4x + 27$ as follows: $10x - 3 = 4x + 27$, so $6x = 30$ and $x = 5$. Explain the error in the student's working. **[2 marks]**

- 16.** The equation $3(x - 4) + k = 2x + 7$ has the solution $x = 9$. Find the value of k . **[3 marks]**

- 17.** Solve $(x - 2) / 3 + (x + 1) / 4 = (5x - 1) / 12$ **[4 marks]**

- 18.** Find the value of a for which $4(2x + 3) = 8x + a$ is true for every value of x . **[2 marks]**

- 19.** A number is increased by 15 and the result is doubled. This gives the same value as five times the original number minus 12. Find the number. **[3 marks]**

- 20.** Mobile Plan A costs £18 per month plus £4 per GB of data. Plan B costs £30 per month plus £2.50 per GB. Find the amount of data for which the two plans cost the same. State that common monthly cost. **[4 marks]**
