Exercise 2

Paper 1 style · No calculator

2 5 marks SL 1.5 · 1.7 ●●○ Typical

Solve the equation $\log_3 x + \log_3(x+6) = 3$, for $x > 0$.

(a) Show that $x^2 + 6x - 27 = 0$. **[2]**

(b) Hence find the value of x, justifying your answer. **[3]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$\log_3\left(x(x+6)\right) = 3$ **M1**

$x(x+6) = 3^3 = 27$ **A1**

$x^2 + 6x - 27 = 0$ **AG**

Total 2 marks

MARKSCHEME (b)

$(x+9)(x-3) = 0$ **(M1)**

$x = 3$ **A1**

$x = -9$ rejected: $\log_3(-9)$ is not defined **R1**

Total 3 marks

Note Or: $x > 0$.