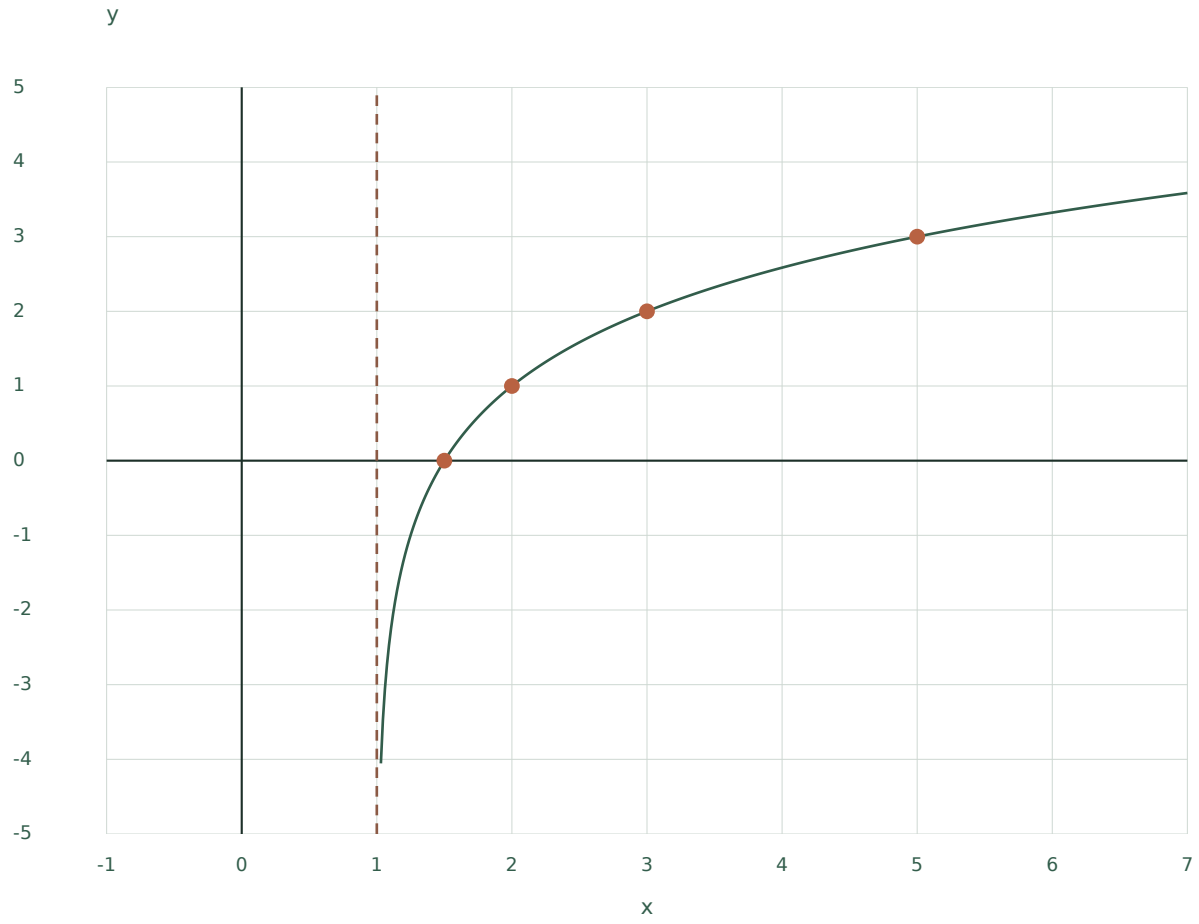
Graphing Logarithmic Functions: Asymptotes, Domain, and Key Points

Worked graph



Dashed brown line is the vertical asymptote x=1. The function is plotted only for x>1. Red marks are the literal source intercept and key points.

Graphing Logarithmic Functions: Asymptotes, Domain, and Key Points

Original worked example / unchanged complete key

Prompt: Graph y = log_2(x - 1) + 1. State the domain, asymptote, x-intercept, and three key points.

Answer: Domain: x > 1. Asymptote: x = 1 (dashed vertical line). x-intercept: solve log_2(x - 1) + 1 = 0, so log_2(x - 1) = -1, x - 1 = 1/2, x = 1.5; intercept (1.5, 0). Key points: x - 1 = 1 gives x = 2, y = 0 + 1 = 1, point (2, 1); x - 1 = 2 gives x = 3, y = 1 + 1 = 2, point (3, 2); x - 1 = 4 gives x = 5, y = 2 + 1 = 3, point (5, 3). Plot these, draw a smooth increasing curve approaching x = 1 from the right, and check (3, 2): log_2(2) + 1 = 1 + 1 = 2.