Sample

November 22, 2025

1 Preamble / Introduction

The point (1, -2) is on the graph of f. Describe the following transformations on f, and determine the resulting point. We use g(x) = a f k(x -d) + c, x' = x k + d, y' = a y + c. a) g(x) = 2f(x) + 3 The a = 2 indicates a vertical stretch by a factor of 2 and the c = 3 indicates a vertical translation of 3 units up. x' = x k + d = 1 1 + 0 = 1 y' = a y + c = 2(-2) + 3 = -1 Therefore, the resulting point is (1, -1) . 6 b) g(x) = f(x + 1) -3 The d = -1 (since x -d = x -(-1) = x + 1) indicates a horizontal translation of 1 unit to the left and the c = -3 indicates a vertical translation of 3 units down. x' = x k + d = 1 1 + (-1) = 0 y' = a y + c = 1(-2) + (-3) = -5 Therefore, the resulting point is (0, -5) . c) g(x) = -f(2x) The a = -1 indicates a reflection in the x-axis and the k = 2 indicates a horizontal compression by a factor of 1/2. x' = x k + d = 1 2 + 0 = 1 2 y' = a y + c = (-1)(-2) + 0 = 2 2, 2 . 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