

$$h(g_1, g_2) = H(g_1, g_2) - H(g_1) - H(g_2) + H(\emptyset)$$

The diagram illustrates the inclusion-exclusion principle for entropy. The equation shows the joint entropy $h(g_1, g_2)$ as the sum of the joint entropy $H(g_1, g_2)$ (represented by a stack of four colored rectangles: light blue, olive green, olive green, and light blue), minus the individual entropies $H(g_1)$ (represented by a stack of two rectangles: olive green and light blue) and $H(g_2)$ (represented by a stack of two rectangles: light blue and light blue), plus the entropy of the empty set $H(\emptyset)$ (represented by a single light blue rectangle). The result is a single olive green rectangle.