$$\operatorname{Hom}_{\mathbf{C}}(f \, \, \, \, \, \, \, g)(z) = (g_1 \, \, \, \, \, \, \, \, f_1) \, \, \, \, \, \, z \, \, \, \, \, \, (f_2 \, \, \, \, \, \, g_2)$$

$$= g_1 \, \, \, \, \, \, (f_1 \, \, \, \, \, \, z \, \, \, \, \, \, f_2) \, \, \, \, \, g_2$$

$$= (f_1 \, \, \, \, \, \, z \, \, \, \, \, \, f_2) \, \, \, \, \, \, \, \, \operatorname{Hom}_{\mathbf{C}}(g)$$

$$= (\operatorname{Hom}_{\mathbf{C}}(f) \, \, \, \, \, \, \, \, \, \operatorname{Hom}_{\mathbf{C}}(g))(z).$$