(d) By part (c), we may take f and g as in (b). Then (b) says Dirichlet composition in that case is direct composition. $\blacksquare$

(e) Let $M = f(1,1)\,g(1,1)$. By Exercise 2.18 $\exists\, x_0, y_0$ s.t. $\exists\, z_0, w_0$

$\gcd(f(x_0,y_0), M) = 1$, $\gcd(g(z_0,w_0), M) = 1$. Then

$$\underbrace{F(X_0, Y_0)}_{\text{these are determined by } x_0, y_0, z_0, w_0} = f(x_0,y_0)\,g(z_0,w_0)$$ is prime to M as well.

$F(\square, \triangle) = f(1,1)\,g(1,1) = M$; so F represents M; by above arguments F represents an integer prime to M, therefore F has to be primitive as well.