

$$\begin{aligned}
 (3) \quad (a) \quad & (((AB)'(D+C')))+F && \text{Given} \\
 & ((A'+B')(D+C'))+F && \text{De Morgan's} \\
 & \boxed{A'D + A'C' + B'D + B'C + F} && \text{Distributive}
 \end{aligned}$$

$$\begin{aligned}
 (b) \quad & ((RST)' + P + ((RS)' + T))' + T && \text{Given} \\
 & ((R' + S' + T') + P + ((R' + S') + T))' + T && \text{De Morgan's} \\
 & ((R' + S' + T') + P + (R' + S' + T))' + T \\
 & \text{Substitute } H = R' + S' + T
 \end{aligned}$$

$$\begin{aligned}
 & (H + P + H)' + T && \text{Substitution} \\
 & (H + H + P)' + T && \text{Commutative} \\
 & (H + P)' + T && \text{Idempotency} \\
 & H'P' + T && \text{De Morgan's} \\
 & (R' + S' + T)'P' + T && \text{Substitution} \\
 & RSTP' + T && \text{De Morgan's} \\
 & T(RSP' + 1) && \text{Distributive} \\
 & \boxed{TRSP'} && \text{Identity}
 \end{aligned}$$