Student Number: [redacted] Name: Bryan Hoang

5. (10 points)

(c) **Answer:**
$1159 = 19 \cdot 61$ and $(19-1)\cdot(61-1) = 1080$. With $e = 73$, the congruence $73d \equiv 1 \pmod{1080}$ has the solution $d \equiv 557 \pmod{1080}$. Therefore, $\boxed{x \equiv 614^{577} \equiv 158 \pmod{1159}}$.

(d) **Answer:**
$8023 = 71 \cdot 113$ and $(71-1)\cdot(113-1) = 7840$. With $e = 751$, the congruence $751d \equiv 1 \pmod{7840}$ has the solution $d \equiv 7151 \pmod{7840}$. Therefore, $\boxed{x \equiv 677^{7151} \equiv 1355 \pmod{8023}}$.