a. $J(700, 1617)$

$\qquad$ $\gcd(700, 1617) = 7$

$\qquad\qquad \Rightarrow J(700, 1617) = 0$

$\qquad J(700, 1617) = \underbrace{J(700, 7)}_{= 0} \times J(700, 231)$

b. $J(100, 173)$ $\qquad\qquad (173^2 - 1)/8 = 3741$

$\qquad = \sim J(50, 173)$

$\qquad\quad = J(25, 173) \qquad (172 \times 24)/4 = 1032$

$\qquad\qquad\qquad\quad \swarrow \text{mod } 25$

$\qquad\quad = J(23, 25) \qquad (22 \times 24)/4 = 132$

$\qquad\qquad\qquad\quad \swarrow \text{mod } 23$

$\qquad = J(2, 23)$

$\qquad\quad = -1^{(23^2 - 1)/8} = -1^{66} = 1$

c. $J(1000, 173)$

$\qquad = J(100 \times 10, 173)$

$\qquad = J(100, 173) \times J(10, 173)$

$\qquad = J(10, 173) \qquad\qquad \swarrow J(100, 173) \sim$

$\qquad\quad = -J(5, 173) \qquad (4 \times 172)/4 = 172$

$\qquad\qquad\qquad \swarrow \text{mod } 5$

$\qquad\quad = -J(3, 5) \qquad\qquad (4 \times 4)/4 = 2$

$\qquad\qquad\qquad \swarrow \text{mod } 3$

$\qquad\quad = -J(2, 3)$

$\qquad\qquad = -(-1^{(3^2 - 1)/8}) = -(-1) = 1$

d. $J(1000, 171)$

$\quad = J(10 \times 10 \times 10, 171)$

$\quad\quad = J(10, 171) \times J(10, 171) \times J(10, 171)$

$\quad J(10, 171) \quad\quad (171^2 - 1)/8 = 3655$

$\quad\quad = -J(5, 171) \quad\quad (4 \times 170)/4 = 170$

$\quad\quad\quad\quad \swarrow mod\ 5$

$\quad\quad = -J(1, 5)$

$\quad\quad\quad = -1$

$J(1000, 171) = -1 \times -1 \times -1$

$\quad\quad\quad\quad\quad = -1$