(a) $\lambda = \infty, C_{T,\text{MH}} = -8/9$
(b) $J = 0 (\lambda = \infty), C_{T,\text{MH}} = 16/9$
(c) $\lambda = 1, C_{T,\text{MH}} = -8/9$
(d) $J = \pi (\lambda = 1), C_{T,\text{MH}} = 16/9$
(e) $J = 2\pi (\lambda = \frac{1}{2}), C_{T,\text{MH}} = 16/9$