Problem 9.3.2

We consider a M/G/1 system with $\lambda = 1$. We can choose between two methods

A: $\nu = \frac{1}{2}$, $\tau^2 = 1/5$,

B: $\nu = \frac{2}{5}$, $\tau^2 = 9/10$.

We apply eq. (9.36) twice to compare the methods:

$$W_a = \nu + \lambda(\tau^2 + \nu^2)/2(1-\rho), \quad (\rho = \lambda\nu)$$
$$= \frac{1}{2} + \frac{9}{20}\lambda/(2-\lambda),$$

$$W_b = \nu + \lambda(\tau^2 + \nu^2)/2(1-\rho)$$
$$= \frac{2}{5} + \frac{53}{50}\lambda/(2-\frac{4}{5}\lambda).$$

For $\lambda = 1$: $W_a = 19/20$ and $W_b = 77/60$, i.e. method A is best here.

Note however that method A becomes unstable before (system) method B. You will also find that W_b will be less than W_a for higher values of λ.