In the textbook we prove that

$$T - t_j \leq T^*.$$

where T is our makespan, t_j is a size of a job and T^* is the optimal makespan. We also proved that the optimal makespan is at least the average load, which is at least 300 in our case:

$$T^* \geq \frac{1}{m} \sum_j t_j \geq \frac{1}{10} 3000 = 300.$$

We also know that $t_j \leq 50$. Therefore the ratio of difference between our makespan and the optimal makespan to the optimal makespan is at most

$$\frac{T - T^*}{T^*} \leq \frac{t_j}{T^*} \leq \frac{50}{300} = \frac{1}{6} \leq 20\%$$

[1] ex995.878.454