Jean-Yves Le Boudec
2017
An information server can be modelled as an M/GI/1 queue. Doubling the capacity of the server would...

A. Reduce the queuing time by a factor 2
B. Reduce the queuing time by a factor larger than 2
C. Reduce the queuing time by a factor smaller than 2
D. It depends on the utilization factor
E. I do not know.
The 3 curves are for an M/GI/1 queue with different distributions of service times. Say which curve is for which distribution.

A. X=B, Y=C; Z=E
B. X=B, Y=E; Z=C
C. X=E, Y=C; Z=B
D. X=C, Y=B; Z=E
E. X=E, Y=B; Z=C
F. X=C, Y=E; Z=B
G. I don’t know

B: Bernoulli with mean \( p = 0.2 \)
C: constant
E: exponential
Which sentences are true?

\( \lambda = \text{arrival rate} \)

\( S = \text{mean service time} \)

A. A

B. B

C. Both

D. None

E. I don’t know

A. For a single server queue, if \( \lambda < \frac{1}{S} \) the queue has a stationary regime

B. For an M/GI/1 queue, if \( \lambda < \frac{1}{S} \) the queue has a stationary regime
A train with 200 tourists arrive at the skilift. A queue builds up. Doubling the capacity of the skilift would...

A. Reduce the queuing time by a factor 2
B. Reduce the queuing time by a factor larger than 2
C. Reduce the queuing time by a factor smaller than 2
D. It depends on the utilization factor
E. I do not know.
The average number of customers present in an $M/GI/\infty$ queue is ... 
($S$ is the mean service time)

A. $N = \lambda S$

B. $N = \frac{\rho}{1-\rho}$ with $\rho = \lambda S$

C. None of the above, the formula involves the coefficient of variation

D. There is no closed form formula

E. I don't know
At a FIFO queue, the expected waiting time for a job, given that its service time is \( s \) is...

A. Independent of \( s \)
B. Proportional to \( s \)
C. Dependent on \( s \) but not proportional (in general)
D. I don’t know.
At a PS (processor sharing) queue, the expected response time for a job, given that its service time is $s$ is...

A. Independent of $s$
B. Proportional to $s$
C. Dependent on $s$ but not proportional (in general)
D. I don’t know.
N is the number of skiers present (in average).

Doubling N would...

A. more than double the waiting time
B. would not significantly impact the waiting time
C. less than double the waiting time
D. none of the above
E. I don’t know