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2. During morning hours, employees arrive randomly at an office drinks dispenser at a rate of 2 every 10 minutes.

The number of employees arriving at the drinks dispenser is assumed to follow a Poisson distribution.

(a) Find the probability that fewer than 5 employees arrive at the drinks dispenser during a 10-minute period one morning.

(2)

During a 30-minute period one morning, the probability that n employees arrive at the drinks dispenser is the same as the probability that $n + 1$ employees arrive at the drinks dispenser.

(b) Find the value of n

(3)

During a 45-minute period one morning, the probability that between c and 12, inclusive, employees arrive at the drinks dispenser is 0.8546

(c) Find the value of c

(3)

(d) Find the probability that exactly 2 employees arrive at the drinks dispenser in exactly 4 of the 6 non-overlapping 10-minute intervals between 10 am and 11am one morning.

(4)

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Q2