Note: In general you should really show your complete work flow. For all these problems this is a matter of determing the rate from the data (or from some model) and the number of events your interested in:

1. x– 3
   λ=122/20 deaths per year
   Poisson probability= **0.085**

1) λ = 6.1 deaths/year
   x = 3

$$P(x) = (e^{-6.1})(6.1^3) / 3!$$
$$= 0.0848$$

= **8.5%** probability that 3 cavalryman will be killed in one year

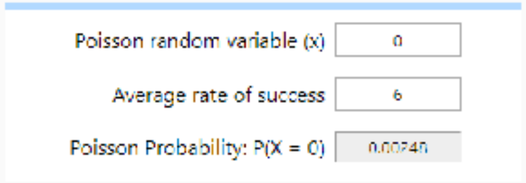
It has been observed that the average number of traffic accidents on the Hollywood Freeway between 7 and 8 AM on Wednesday mornings is 1 per hour. What is the chance that there will be 2 accidents on the Freeway some given Wednesday morning during this time interval?

x=2 rate=1 probability= 0.184

2) λ = 1 traffic accident/ Wednesday morning
   x = 2

$$P(x) = (e^{-1})(1^2) / 2!$$
$$= 0.1839$$

= **18.4%** probability that 2 traffic accidents will occur on the Freeway during 7-8 AM on Wednesday



It is 8 PM in Nebraska, near the end of summer, and, our heroine, Sunshine Moonbeam is watching fireflies on the back porch. From the last few nights on the porch at that hour, she knows that the average number of firefly flashes is 6 per minute. She refuses to go to bed until 2 minutes pass in which she observes no flashes - that way she knows that the fireflies have said good night to her. What is the probability of observing 0 flashes in a 2 minute period?

x=0 rate=6 probability= .00248

But the question asks about two minute interval not one

3) $\lambda = 12$ firefly flashes/ 2 minutes
$x = 0$

$$P(x) = (e^{-12})(12^{0}) / 0!$$
$$= 6.144 \bullet 10^{-6}$$

= **0.0006%** probability that Sunshine Moonbeam observes 0 firefly flashes in 2 minutes

4. The switchboard in a small Denver law office gets an average of 2.5 incoming phone calls during the noon hour on Thursdays. Experience shows that the reduced staffing during lunch can handle up to 5 calls in that hour. What is the chance of 6 calls being received during that period, some particular Thursday?

x=6 rate=2.5 probability= .0278

For question 5 you have to solve for X since you know P(x) = 10%

5) $\lambda = 3$

$P(x) = 0.10$

$0.10 = (e^{3})(3^{x}) / x!$

$x = 5$

= The bank needs to have **5** tellers on duty at that time.

Solve the problem by trial and error. Plug in say x=2 and see if that gives you 10%; if not, try another value of x

6. Idaho's Trout'R'Us lake is continually stocked with trout. Anglers average catching 2 trout per hour. Dweebo's girlfriend, Dweizel is a dedicated fisherman. Dweebo know's he will win Dweizel's hand if she catches a trout while fishing together. Since Dweizel can not stand incompetence, she can not tolerate catching 0 fish. Plus, Dweizel is really impatient and can only stand to fish (with Dweebo) for 0.5 hours. What is the probability that Dweebo will not win her hand (or anything else ...)?

x= 0 rate=1 probability= 0.368

Over the last 500 million years there have been 31 asteroid impacts that have extincted at least 1/3 of all life on the planet. What is the probability that the next extinction event will occur during the next 1 million years?

x= 1 rate= .062 probability= .058

8. x= 2
   λ= 0.058 storms per year
   Poisson probability= **0.002**