**Suppose that infants are classified as low birth weight if they have birth weight  2500g, and as normal birth weight if have birth weight  2501g. Suppose that infants are also classified by length of gestation in the following four categories: <20 weeks, 20-27 weeks, 28-36 weeks, >36 weeks. Assume the probabilities of the different period of gestation are as given in the table below:**

Distribution of length of gestation

|  |  |
| --- | --- |
| Length of gestation | Probability |
| <20 weeks | .0004 |
| 20-27 weeks | .0063 |
| 28-36 weeks | .0848 |
| >36 weeks | .9085 |

Also assume that the probability of low birth weight given that length of gestation is <20 weeks is .540, the probability of low birth weight given that length of gestation is 20-27 weeks is .813, the probability of low birth weight given that length of gestation is 28-36 weeks is .378, and the probability of low birth weight given that length of gestation is >36 weeks is .031.

a) What is the probability of having a low birth weight infant?

b) Show that the events {length of gestation  27 weeks} and {low birth weight} are not independent.