Questions 1 to 6 are based on material covered in *Chapter 6*.

Question 1

Ten observations on the geometric distribution Geometric(p) were recorded as follows: 3, 4, 4, 2, 1, 1, 4, 3, 3, 1. Use these data to calculate the moment estimate $\hat{p}$ for the unknown parameter p.

B

$\hat{p} = \frac{1}{\bar{x}}$

Options

A 11/27	**B** 5/13	**C** 0.525	**D** 0.475
E 16/27	**F** 8/13	**G** 13/21	**H** 1/3

Question 2

Suppose that leaf characteristics for a particular plant are either Type A or Type B or Type C, with respective probabilities θ, θ^2 or $(1-\theta-\theta^2)$ where θ is unknown. In a particular experiment, a sample of 360 plants yields 140 of Type A, 94 of Type B; the rest were Type C. Choose from the following options the likelihood for θ, based on these data.

$\theta^{140}\theta^{188}(1-\theta-\theta^2)^{126}$

Options

A θ	**B** $\theta^{328}(1-\theta-\theta^2)^{32}$	**C** $1-\theta$
D θ^{234}	**E** $\theta^{234}(1-\theta-\theta^2)^{126}$	**F** $(1-\theta-\theta^2)^{126}$
G $\theta^{328}(1-\theta-\theta^2)^{126}$	**H** $\theta^{328}(1-\theta-\theta^2)^{116}$	

Question 3

Question 2, continued. Using the likelihood function given in Question 2, find the maximum likelihood estimate of θ for the sample.

Options

A 0	**B** 0.5436	**C** 0.4564	**D** 1
E 0.5	**F** 0.3889	**G** 0.2083	**H** 0.2955

Question 4

Assuming that the Pareto distribution with $K = 1$ but unknown parameter θ provides an adequate model for the inherent variation on some measurement within a population, calculate the moment estimate and the maximum likelihood estimate for θ based on the following sample: 1.136, 2.784, 2.768, 1.824, 1.747, 1.385, 1.488, 1.394, 4.087, 1.056. (Choose two options.)

Options

A 1.034	**B** 2.618	**C** 1.711	**D** 1.618
E 2.711	**F** 2.034	**G** 1.967	**H** 0.711