146. Let $x_1, x_2, \ldots, x_n$ and $y_1, y_2, \ldots, y_m$ denote independent random samples of losses from Region 1 and Region 2, respectively. Single-parameter Pareto distributions with $\theta = 1$, but different values of α, are used to model losses in these regions.

Past experience indicates that the expected value of losses in Region 2 is 1.5 times the expected value of losses in Region 1. You intend to calculate the maximum likelihood estimate of α for Region 1, using the data from both regions.

Which of the following equations must be solved?

(A) $$\frac{n}{\alpha} - \sum \ln(x_i) = 0$$

(B) $$\frac{n}{\alpha} - \sum \ln(x_i) + \frac{m(\alpha+2)}{3\alpha} - \frac{2\sum \ln(y_i)}{(\alpha+2)^2} = 0$$

(C) $$\frac{n}{\alpha} - \sum \ln(x_i) + \frac{2m}{3\alpha(\alpha+2)} - \frac{2\sum \ln(y_i)}{(\alpha+2)^2} = 0$$

(D) $$\frac{n}{\alpha} - \sum \ln(x_i) + \frac{2m}{\alpha(\alpha+2)} - \frac{6\sum \ln(y_i)}{(\alpha+2)^2} = 0$$

(E) $$\frac{n}{\alpha} - \sum \ln(x_i) + \frac{3m}{\alpha(3-\alpha)} - \frac{6\sum \ln(y_i)}{(3-\alpha)^2} = 0$$