Figures for Maximum Likelihood Talk

Jon A. Wellner

University of Washington

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Email: jaw@stat.washington.edu
http: //www.stat.washington.edu/jaw/jaw.research.html

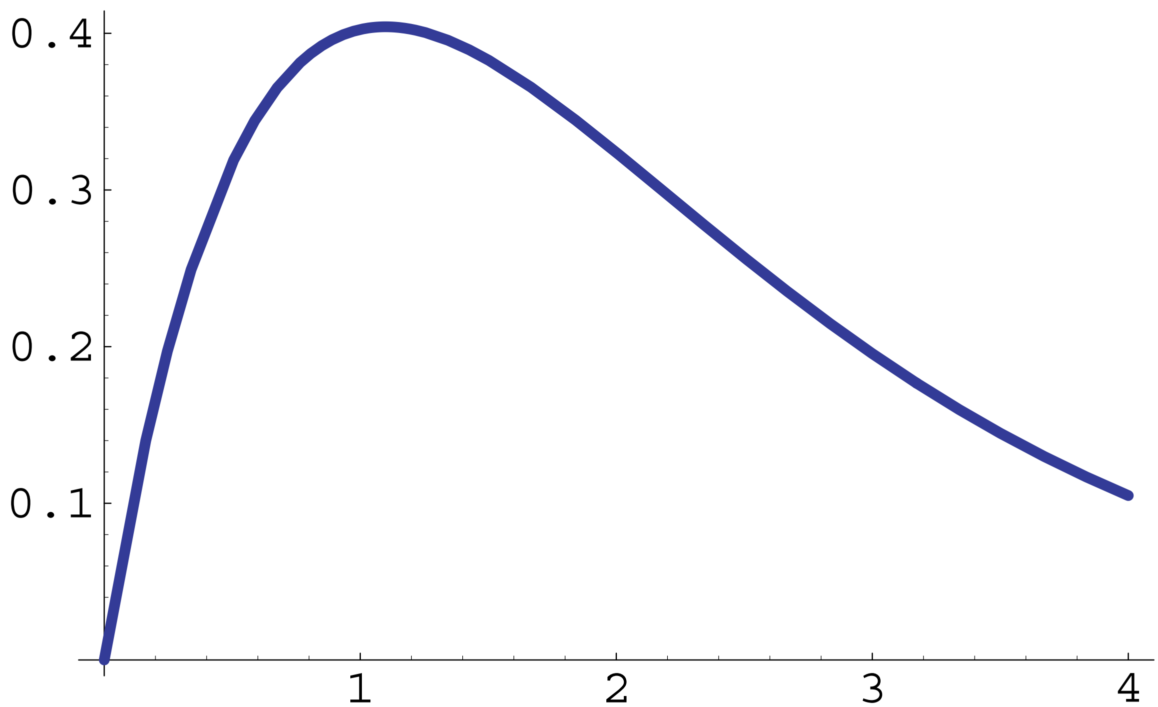

Figure 1: $1/n$ power of Exponential Likelihood, $n = 50$

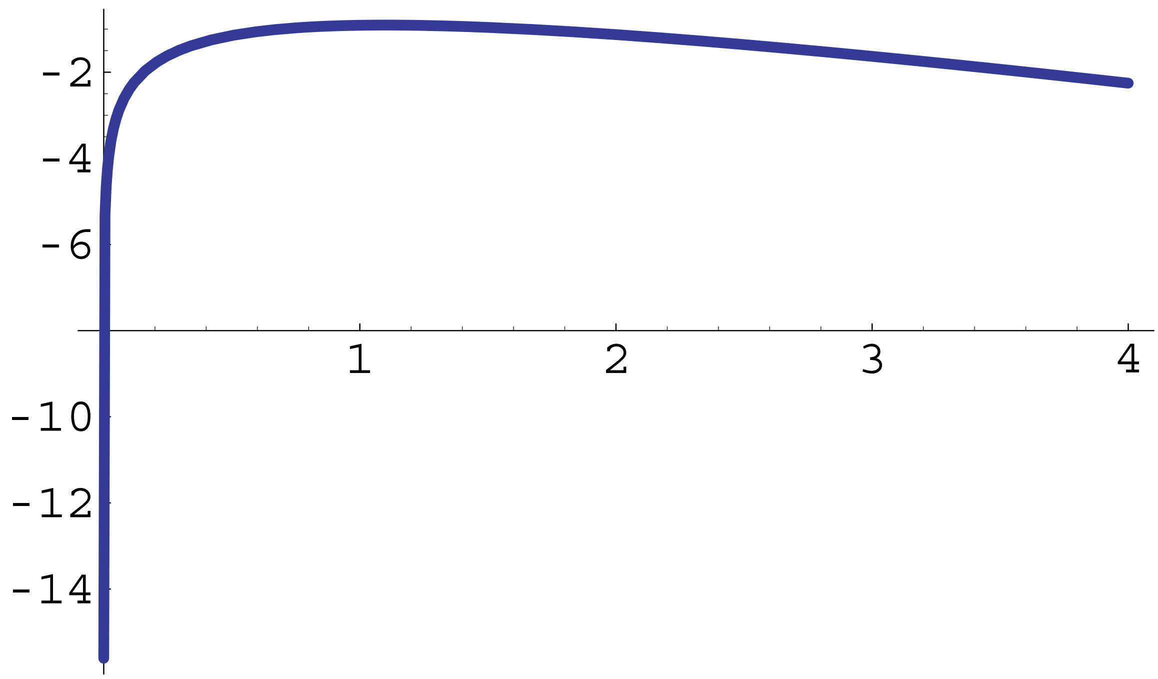

Figure 2: $1/n$ times log-likelihood, $n = 50$

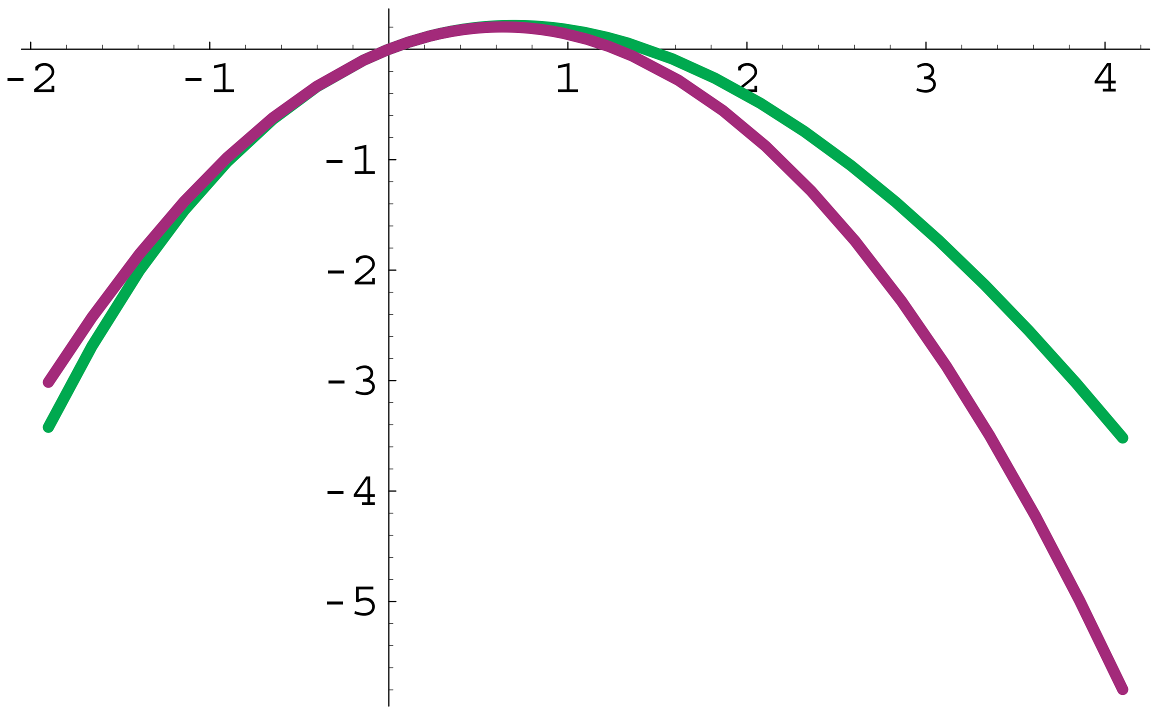

Figure 3: Local log-likelihood ratio and LAN approximation

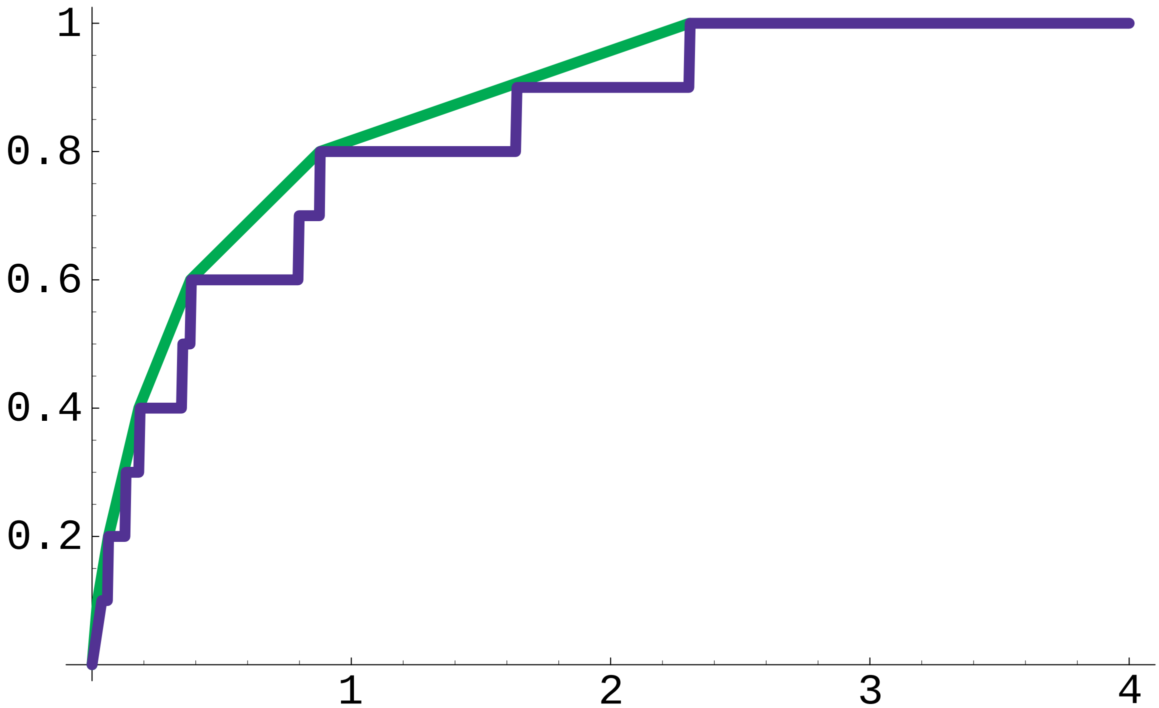

Figure 4: Empirical df $\mathbb{F}_n$ and least concave majorant $\mathbb{C}_n$, $n = 10$

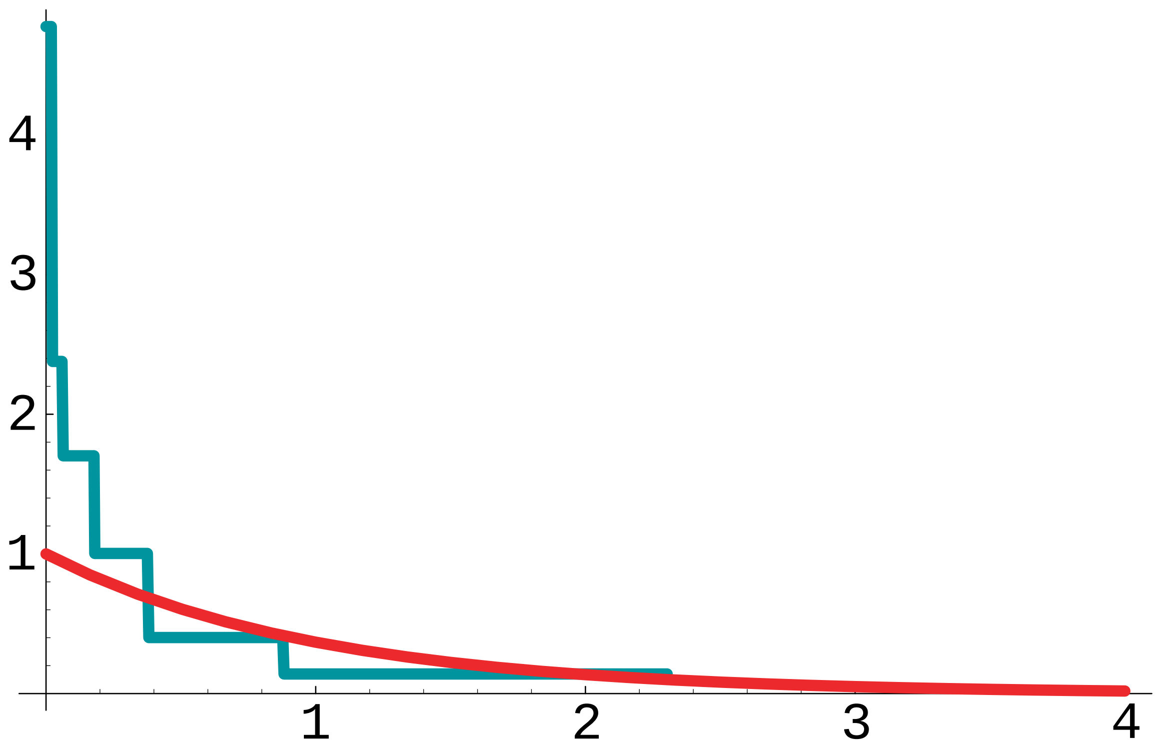

Figure 5: Grenander Estimator, $n = 10$

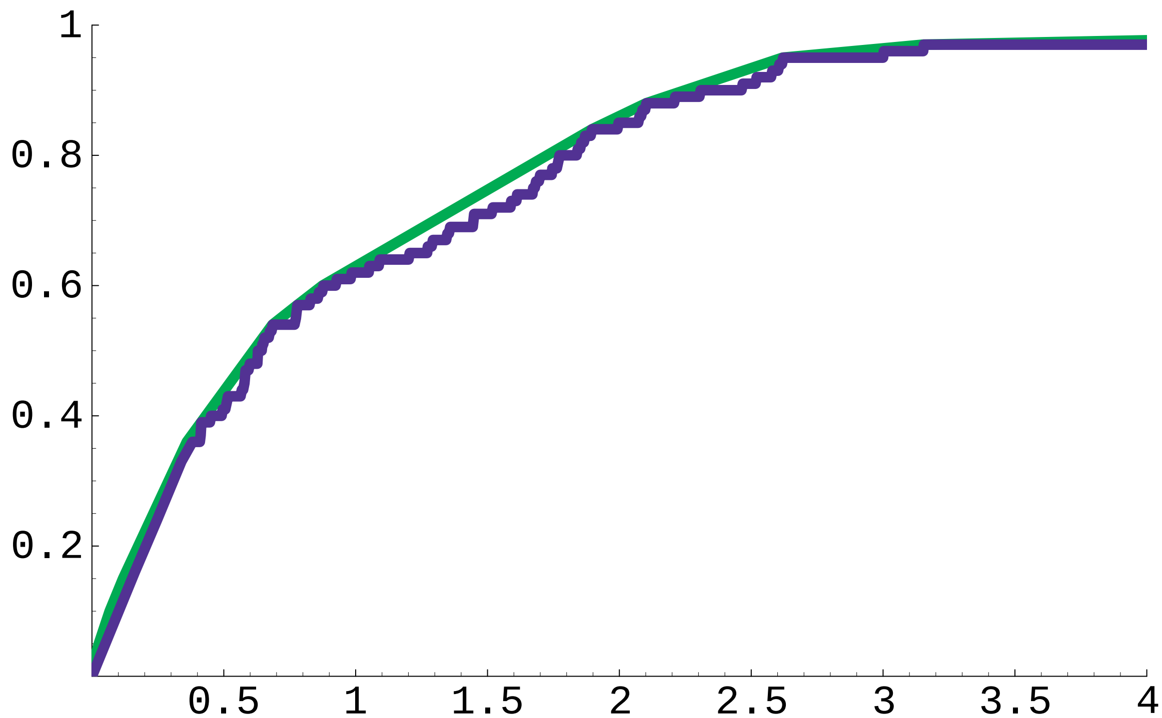

Figure 6: Empirical df $\mathbb{F}_n$ and least concave majorant $\mathbb{C}_n$, $n = 100$

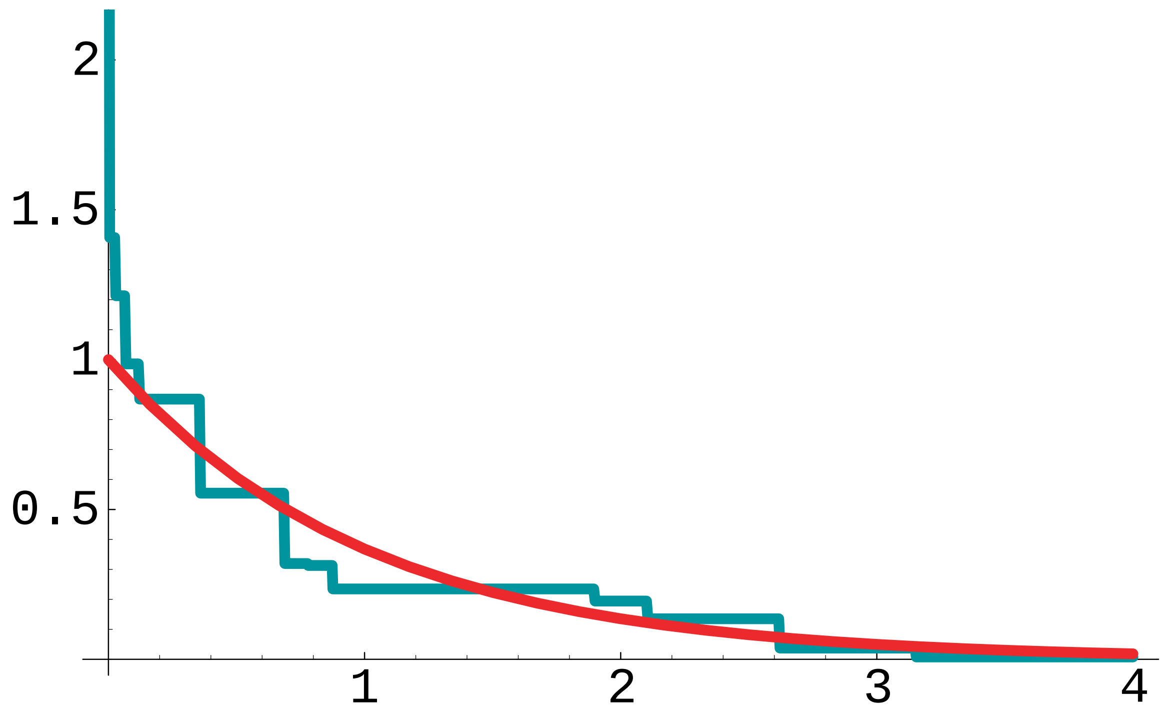

Figure 7: Grenander Estimator, $n = 100$

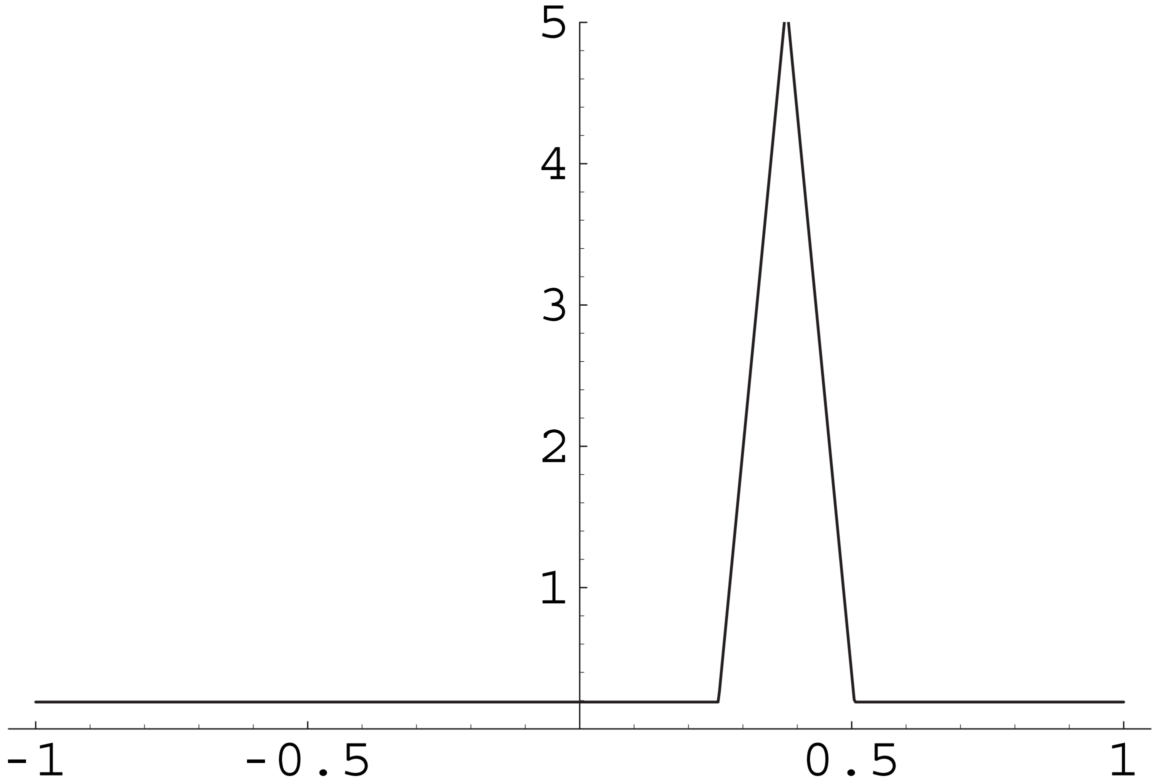

Figure 8: Density in Ferguson's example, $c = 2$, $\theta = .38$

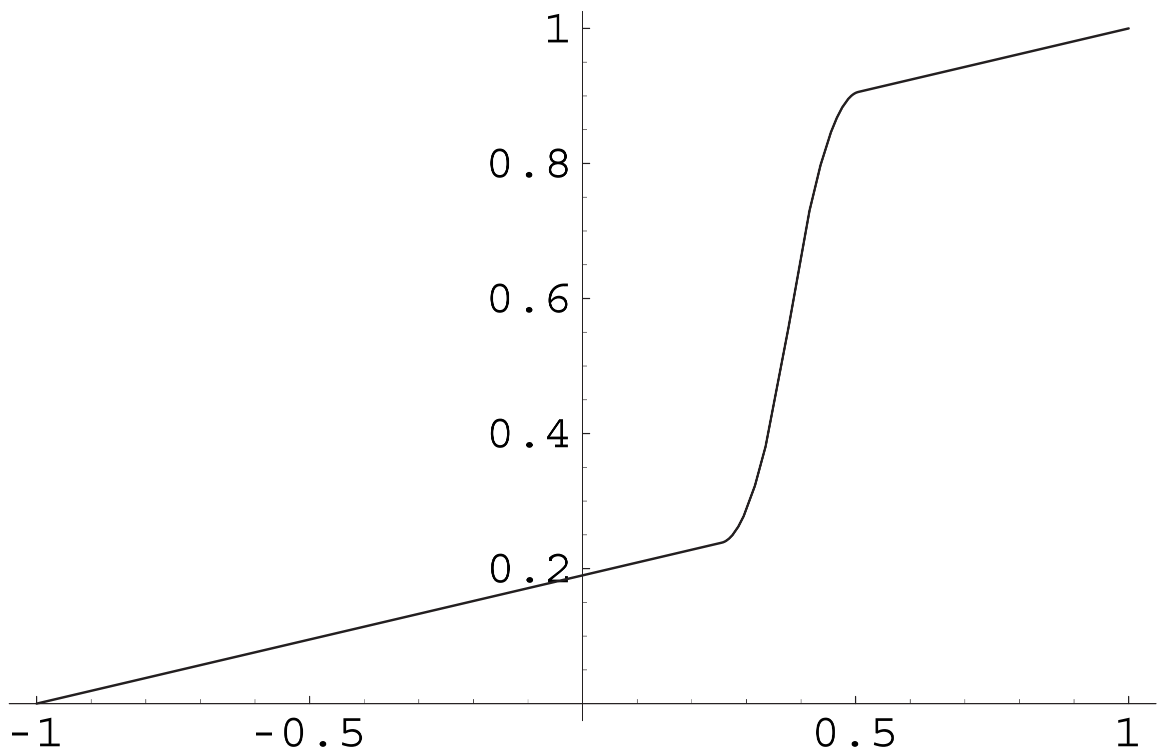

Figure 9: Distribution function, Ferguson's example $c = 2$, $\theta = .38$

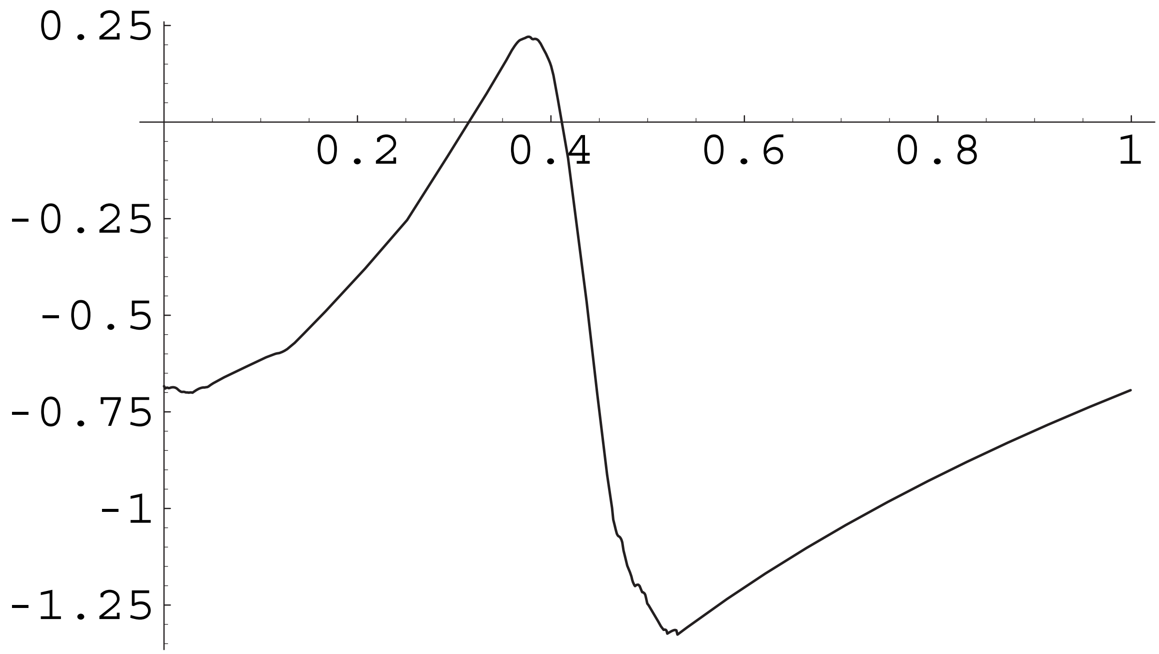

Figure 10: $1/n$ times Log-likelihood, Ferguson's example, $c = 2$, $\theta_0 = .38$, $n = 200$.

$$n^{-1} \log L_n(.38) = .216\ldots,$$
$$n^{-1} \log L_n(X_{(n)}) = 1557.86,$$
$$X_{(n)} = .99821\ldots$$

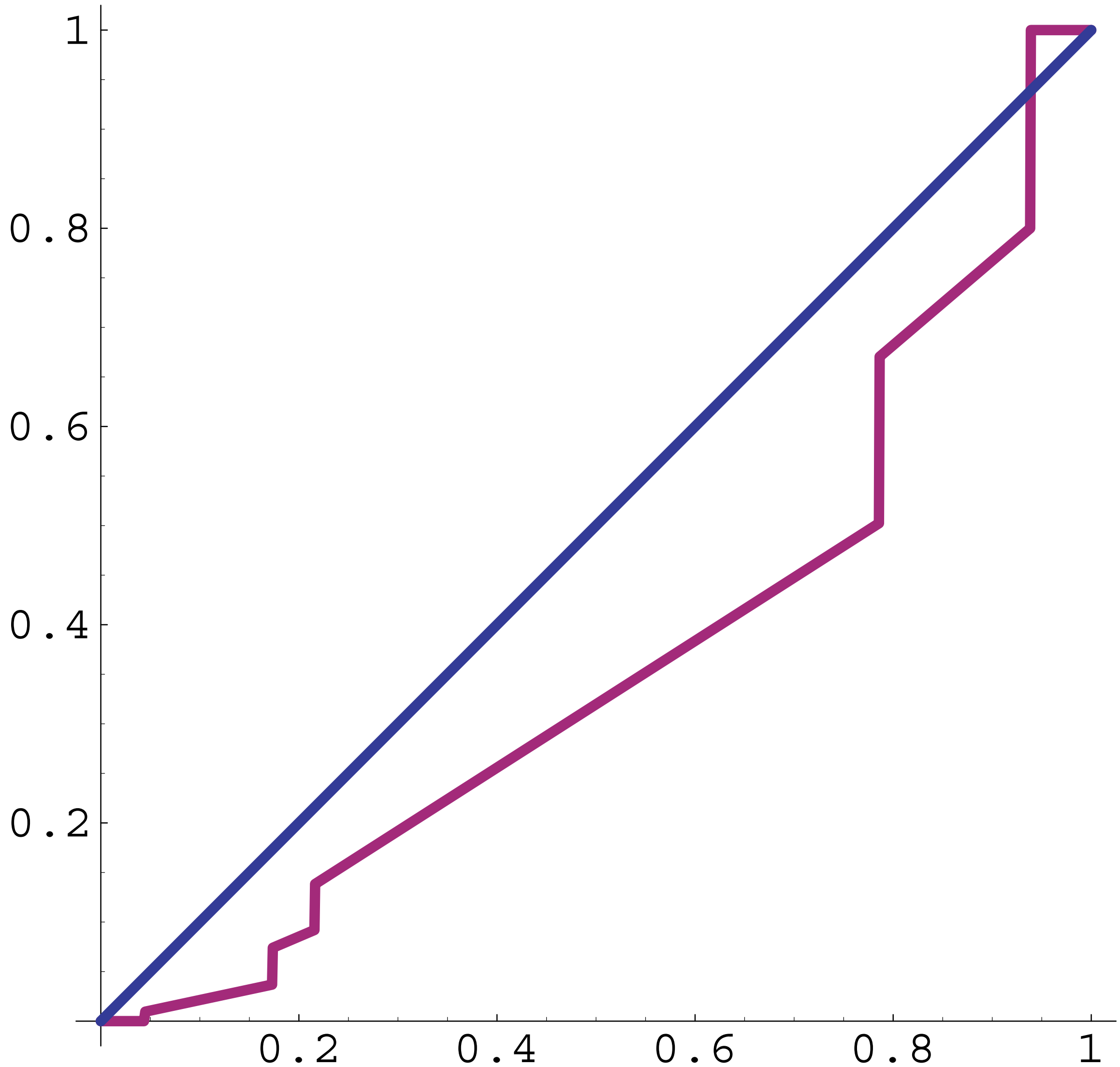

Figure 11: Estimator of Star-shaped distribution, $n = 5$, truth $= U[0, 1]$

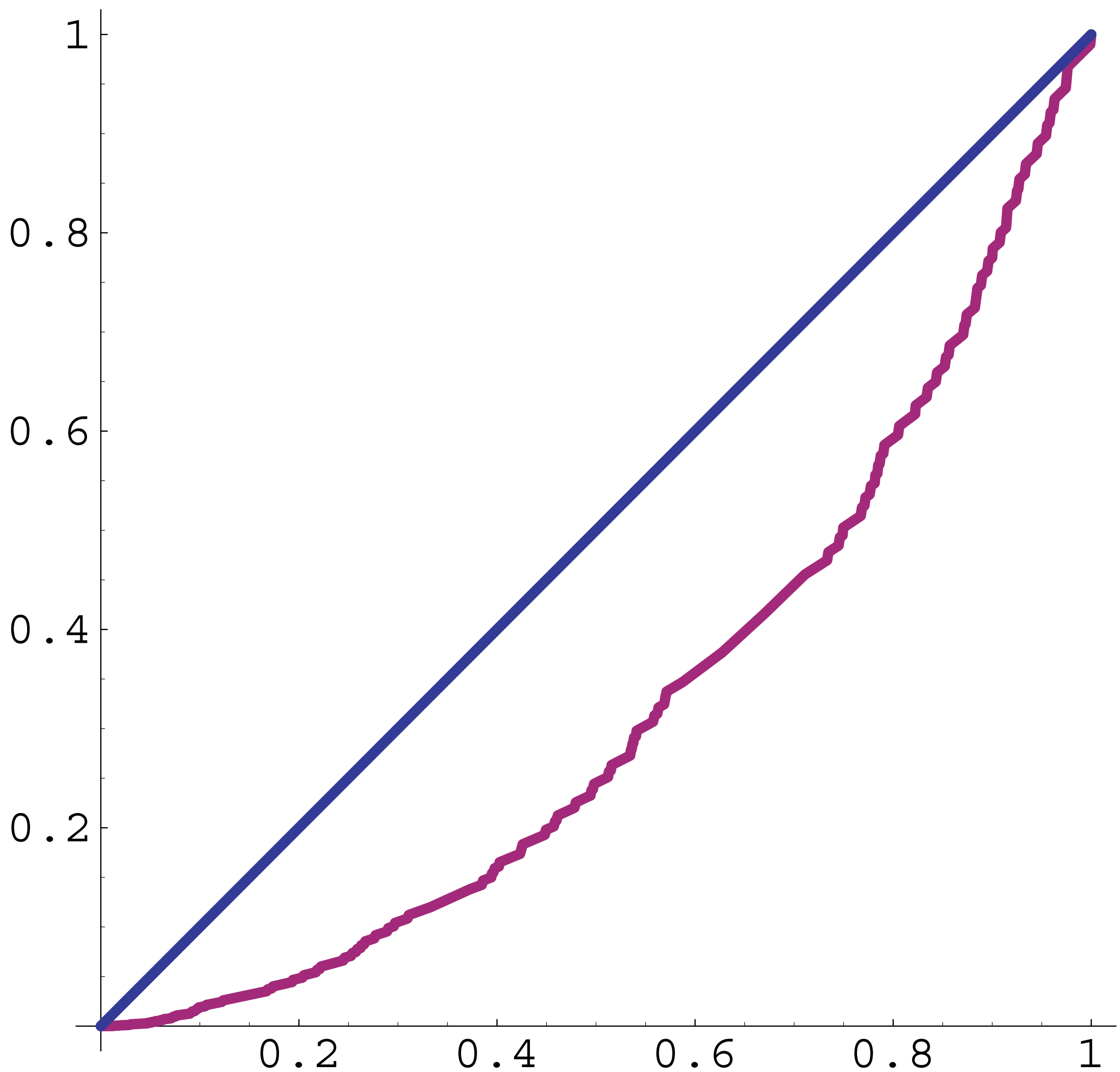

Figure 12: Estimator of Star-shaped distribution, $n = 100$, truth $= U[0, 1]$

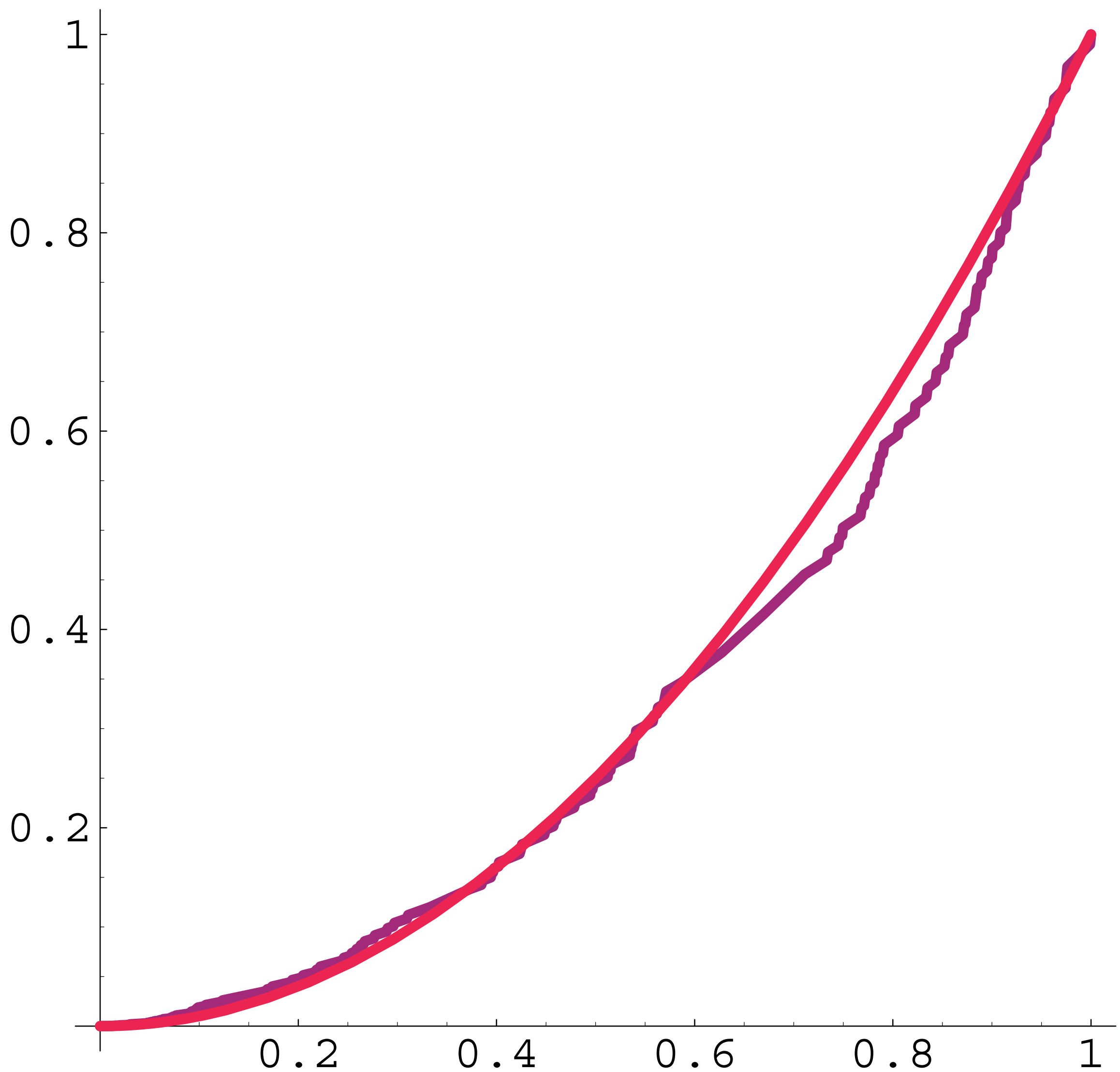

Figure 13: Estimator of Star-shaped distribution, $n = 100$, limit $= x^2$

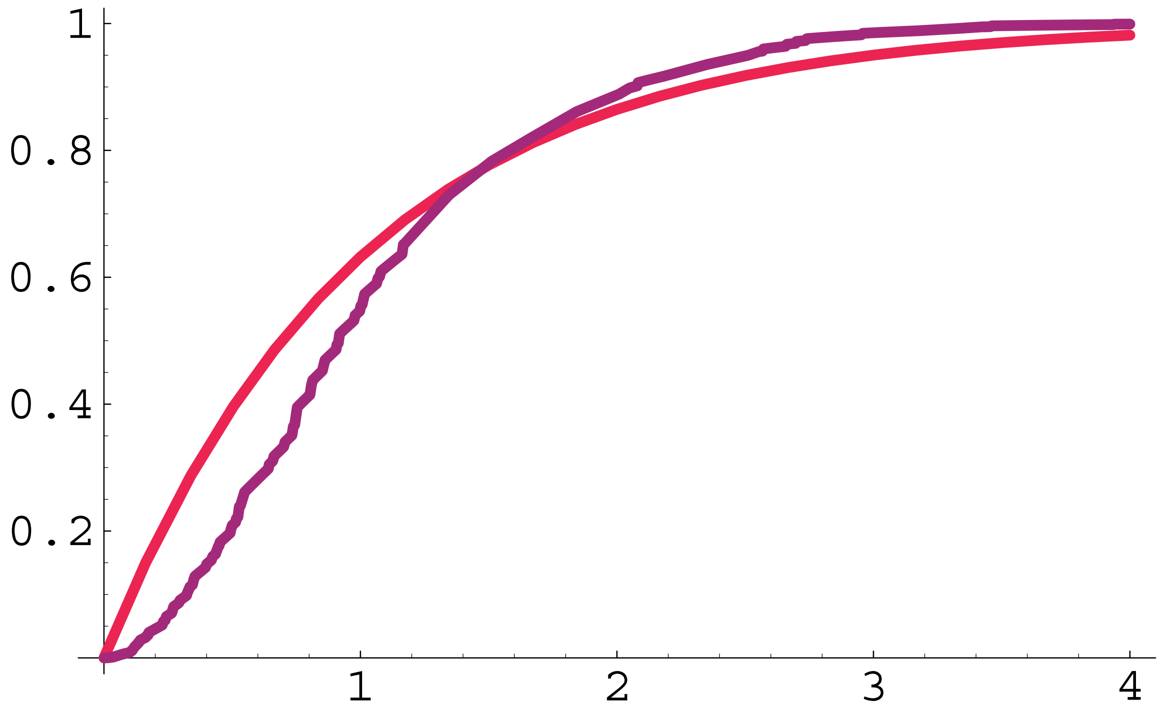

Figure 14: Estimator of IFRA distribution, $n = 100$, truth $= exp(1)$

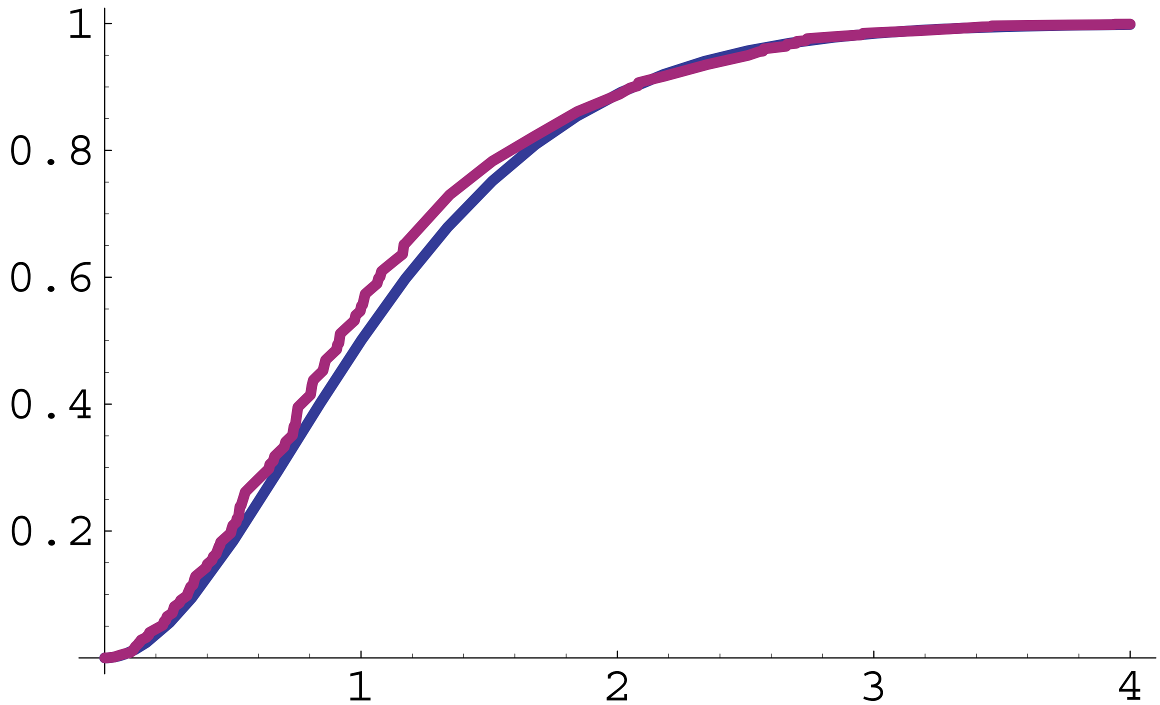

Figure 15: Estimator of IFRA distribution, $n = 100$, limit $= (1 + x)^{-x}$

$$F_{lim}(x) = (1 + x)^{-x}, \quad x \geq 0$$

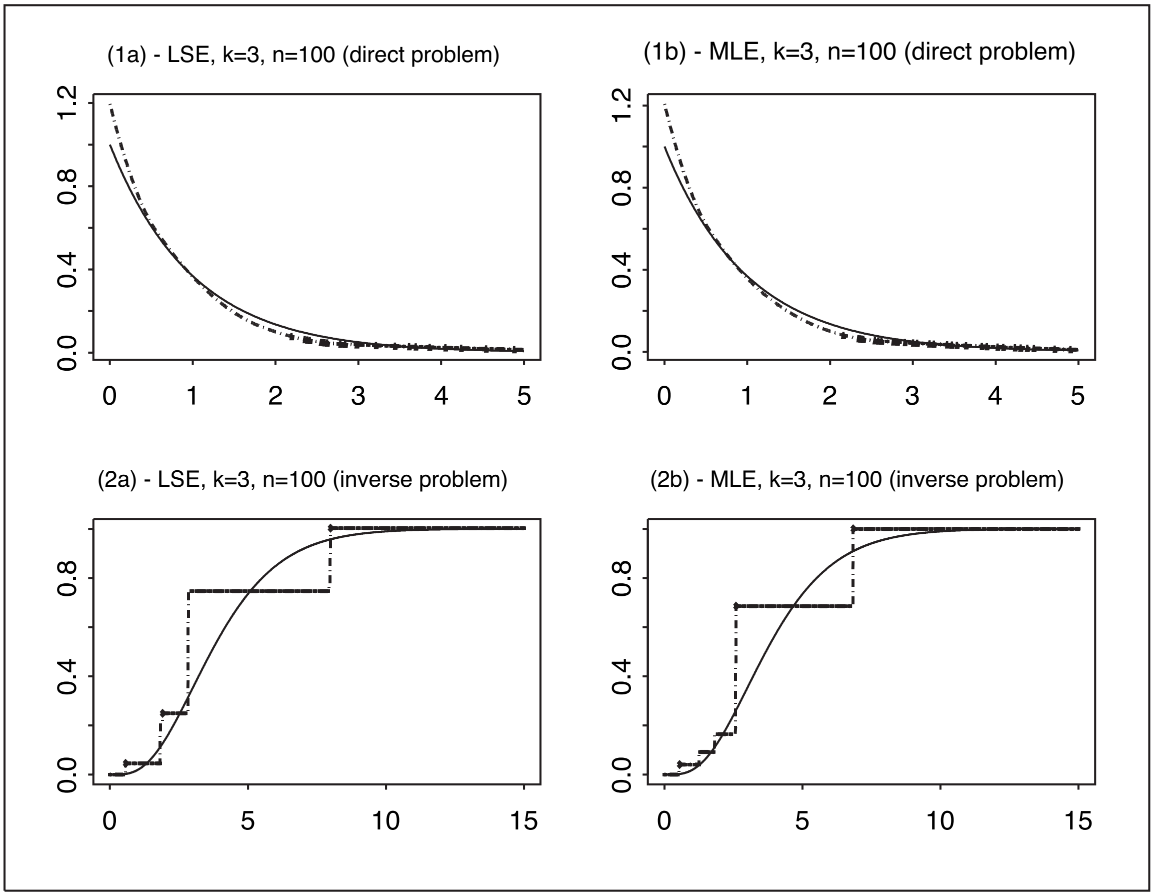

Figure 16: Direct and Inverse estimators $k = 3$, $n = 100$.

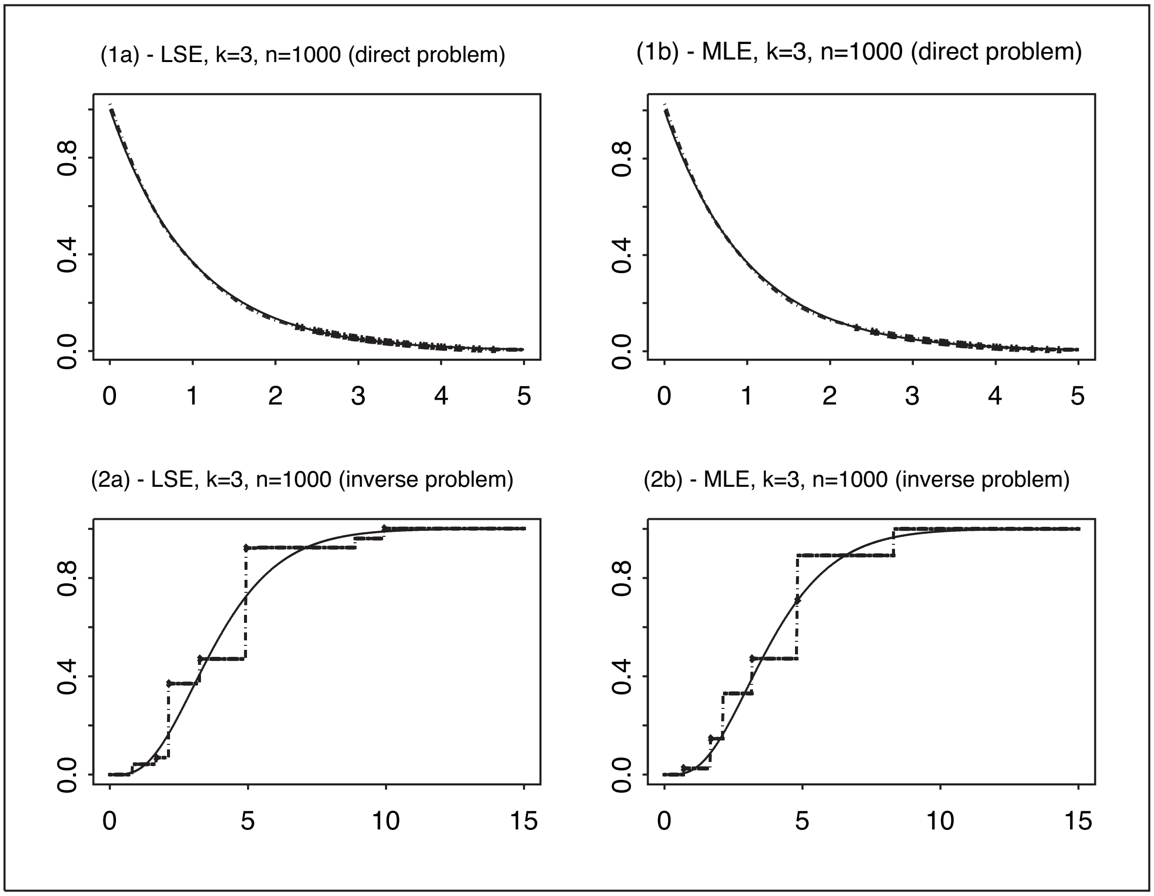

Figure 17: Direct and Inverse estimators $k = 3$, $n = 1000$.

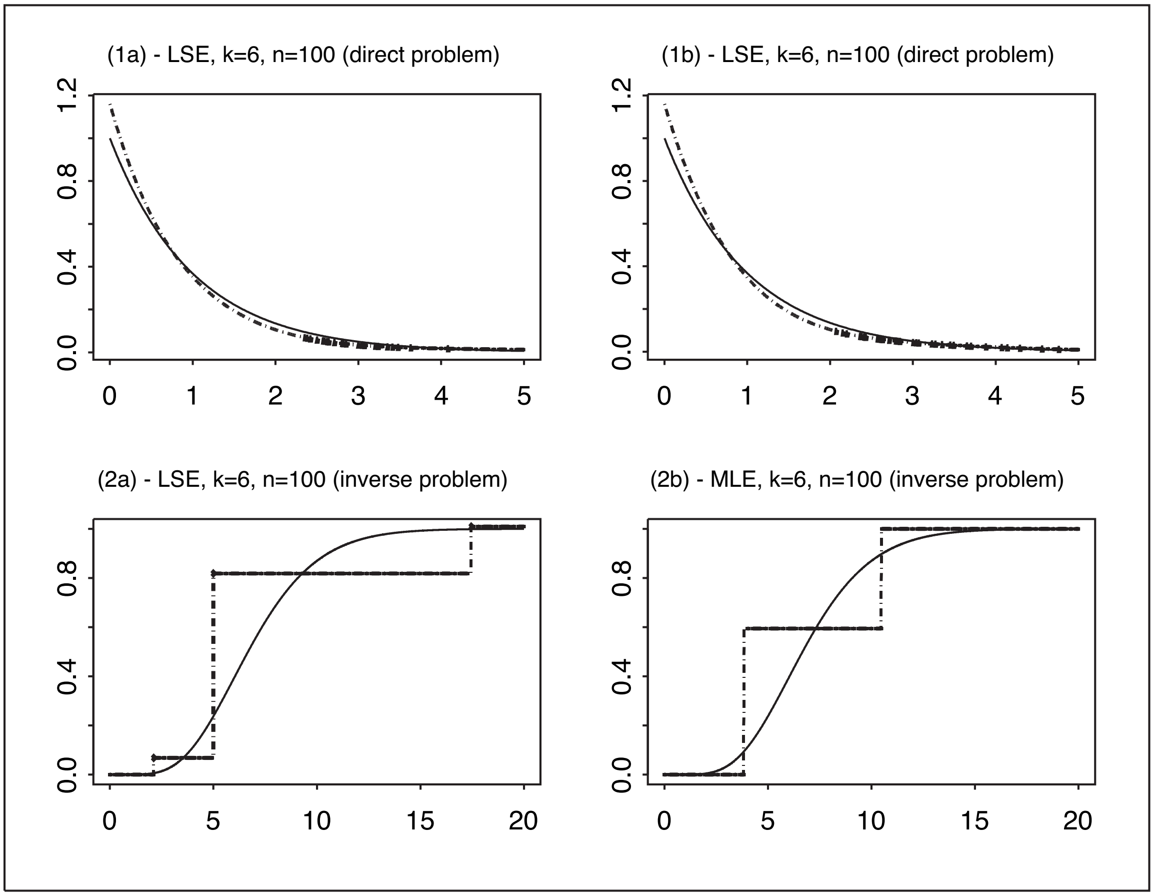

Figure 18: Direct and Inverse estimators $k = 6$, $n = 100$

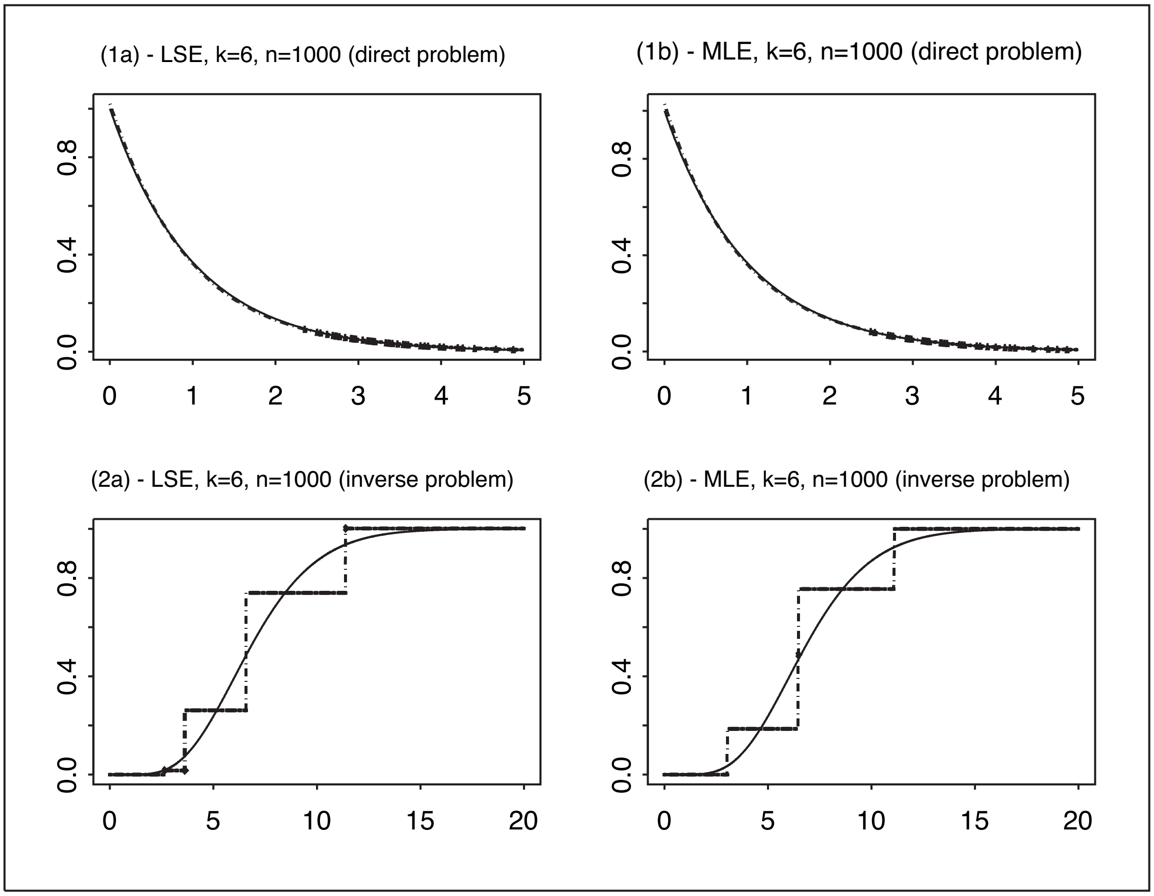

Figure 19: Direct and Inverse estimators $k = 6$, $n = 1000$.

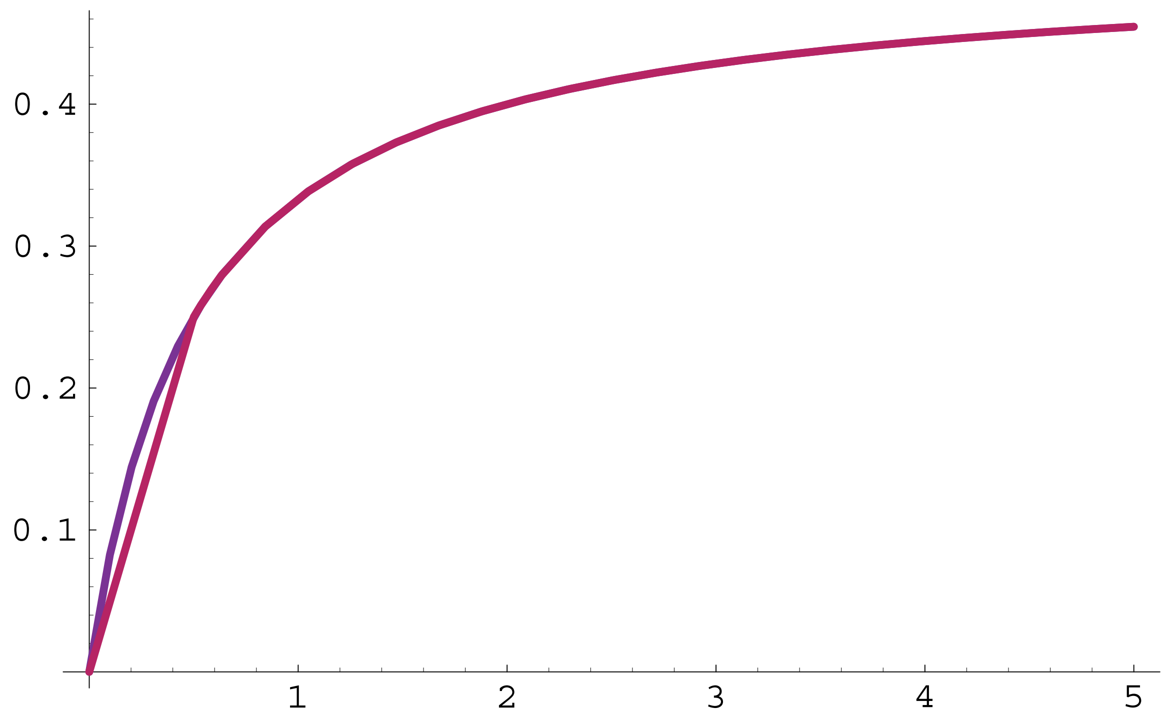

Figure 20: Optimal rate and MLE rate as a function of γ

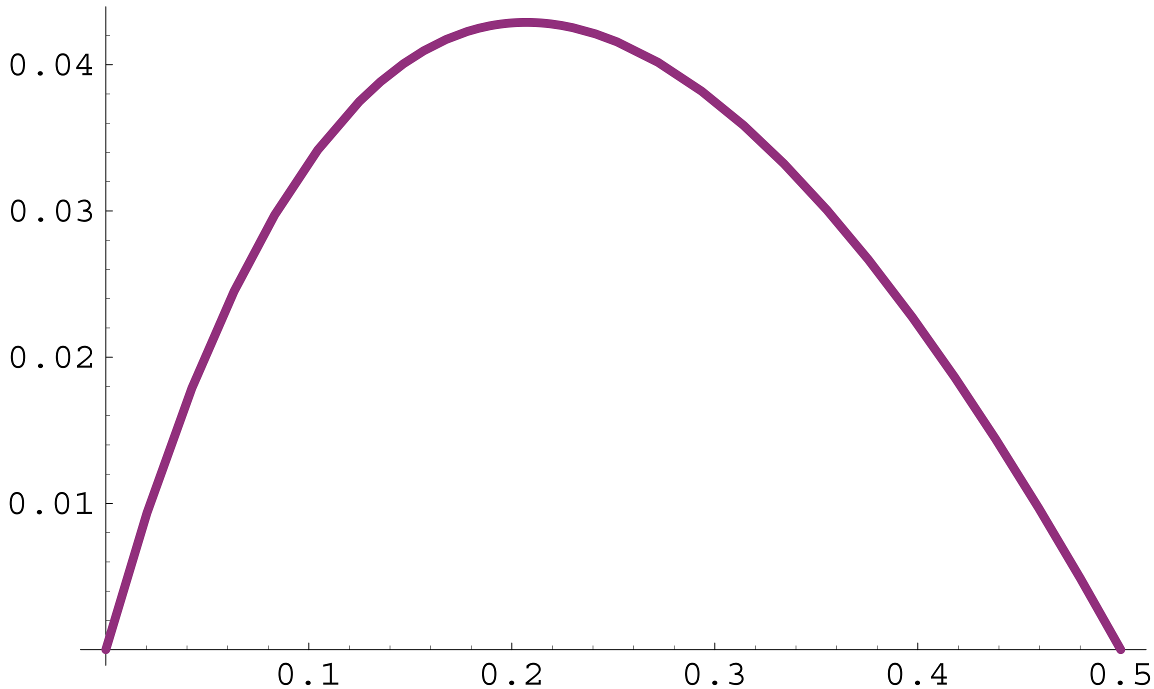

Figure 21: Difference of rates $\gamma/(2\gamma+1) - \gamma/2$

$$d(\gamma) = \frac{\gamma}{2\gamma+1} - \frac{\gamma}{2} = \frac{\gamma(1-2\gamma)}{2(2\gamma+1)}$$

$d(\gamma_0) = 0.0428932,$

$$\text{argmax}\ d(\gamma) = \gamma_0 = \frac{1}{2}(\sqrt{2}-1) = 0.207107...$$

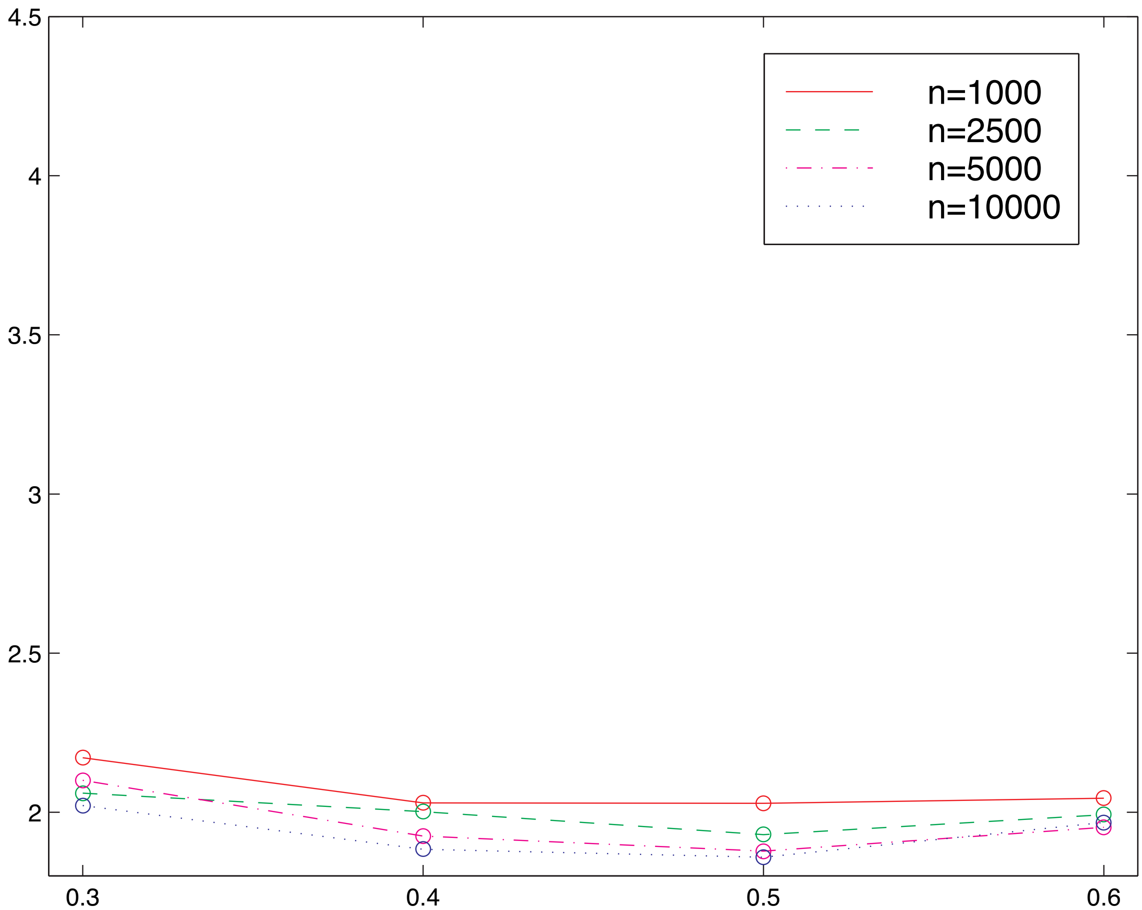

Figure 22: MSE of histogram estimator divided by MSE of MLE $f_0(t) = 1$

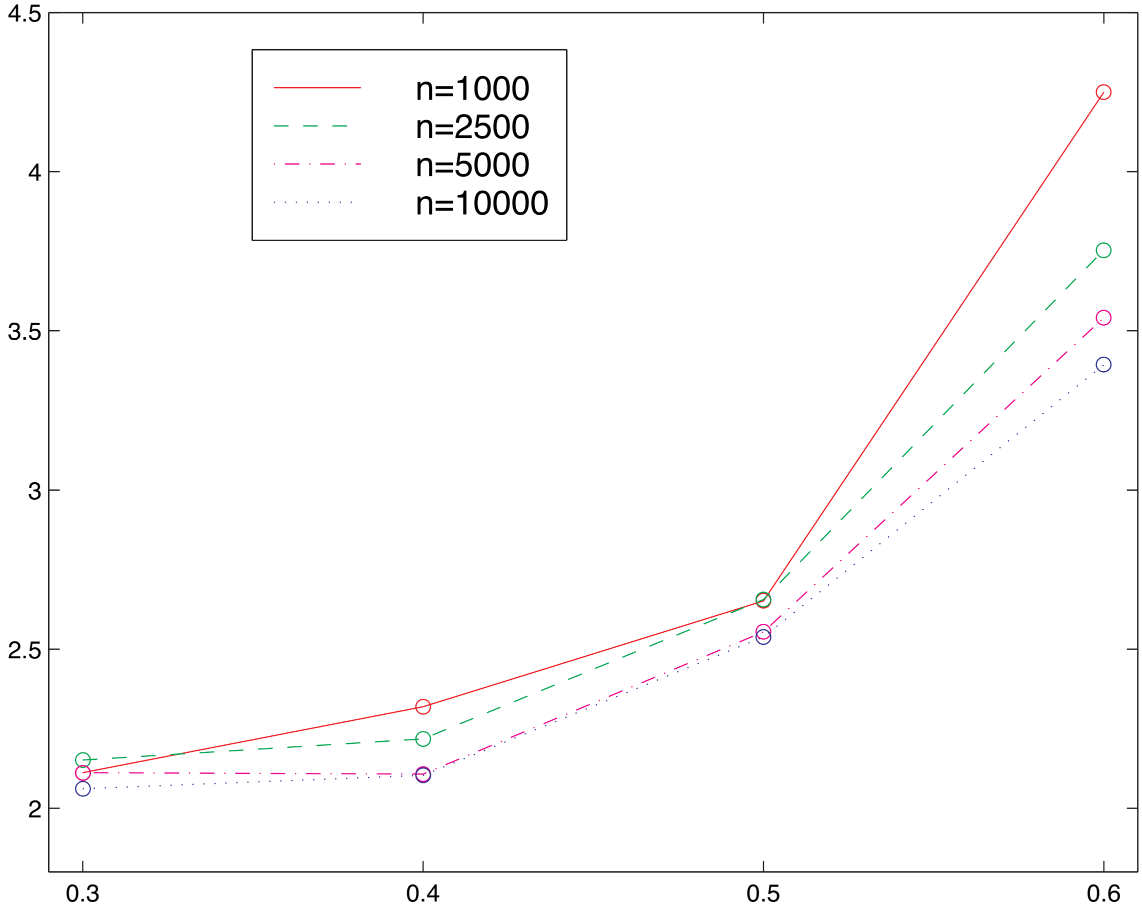

Figure 23: MSE of histogram estimator/MSE of MLE $f_0(t) = 4(1-t)^3$

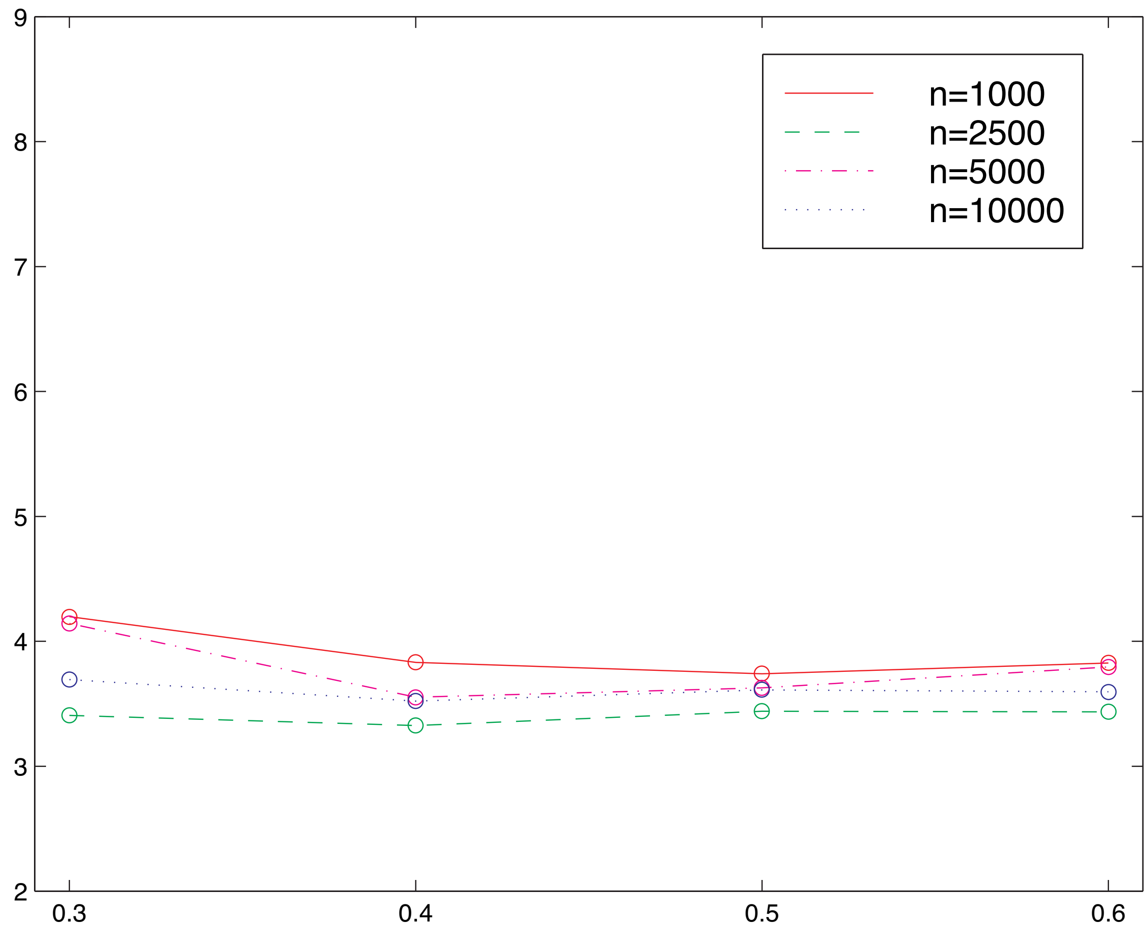

Figure 24: MSE of histogram estimator divided by MSE of MLE, $f_0(t) = 1$

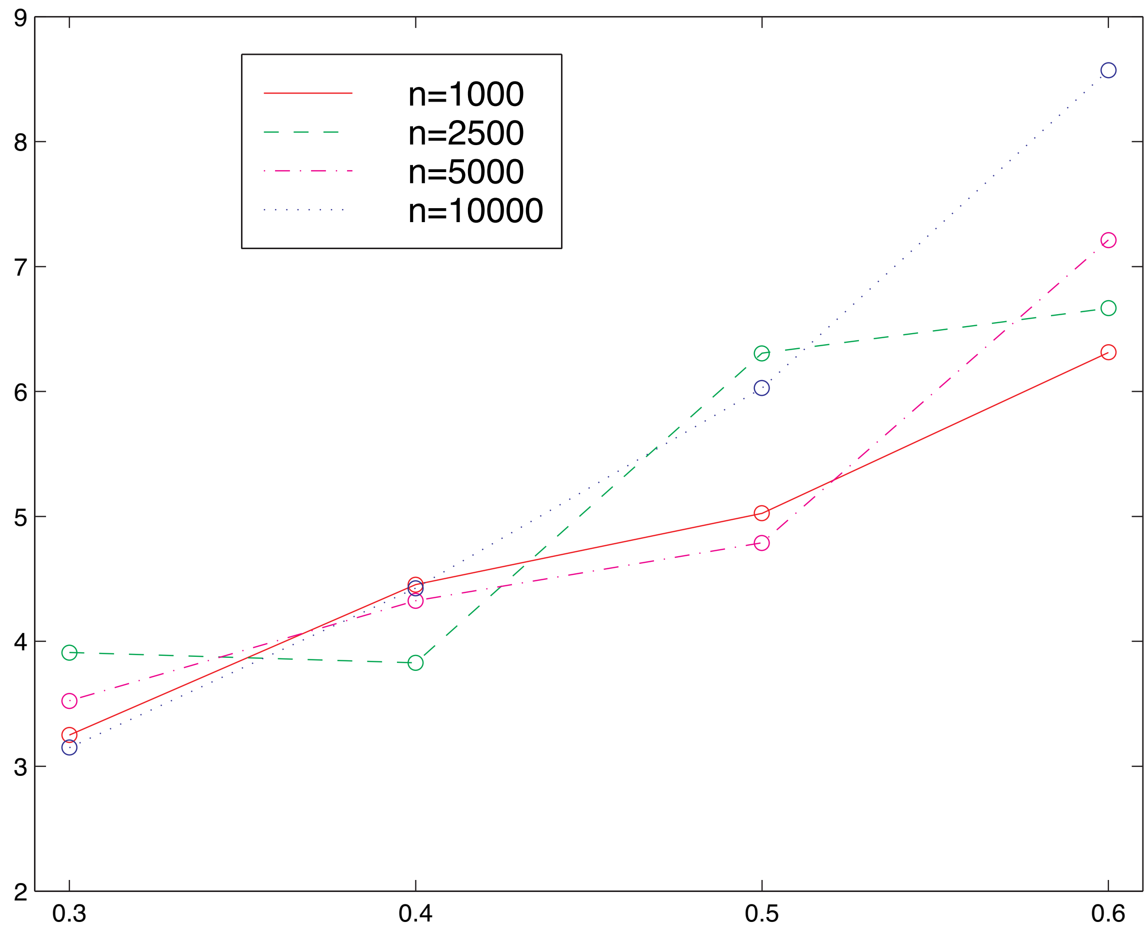

Figure 25: MSE of histogram estimator divided by MSE of MLE $f_0(t) = 4(1-t)^3$

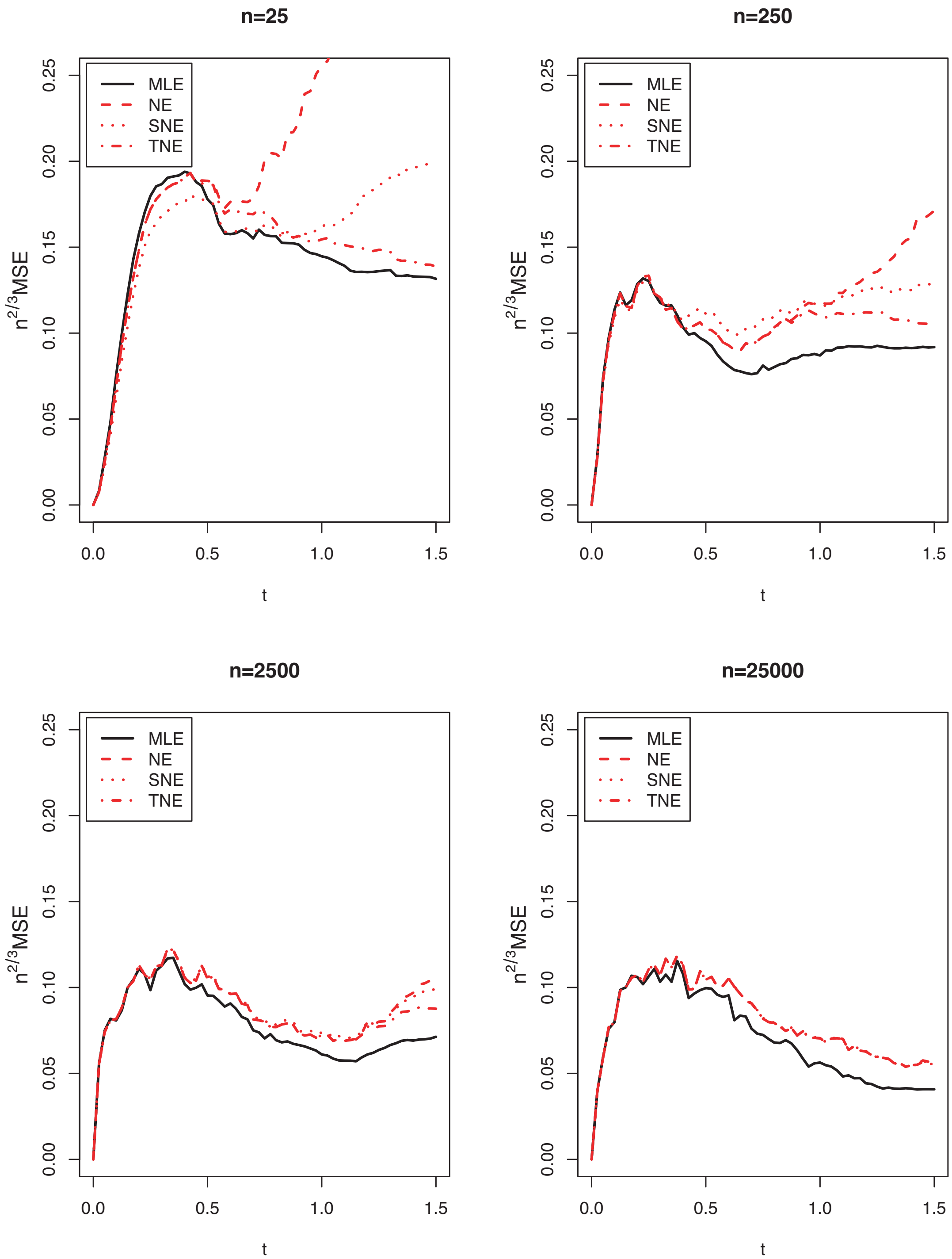

Figure 26: $n^{2/3}\times$ MSE of MLE and naive estimators of F_1

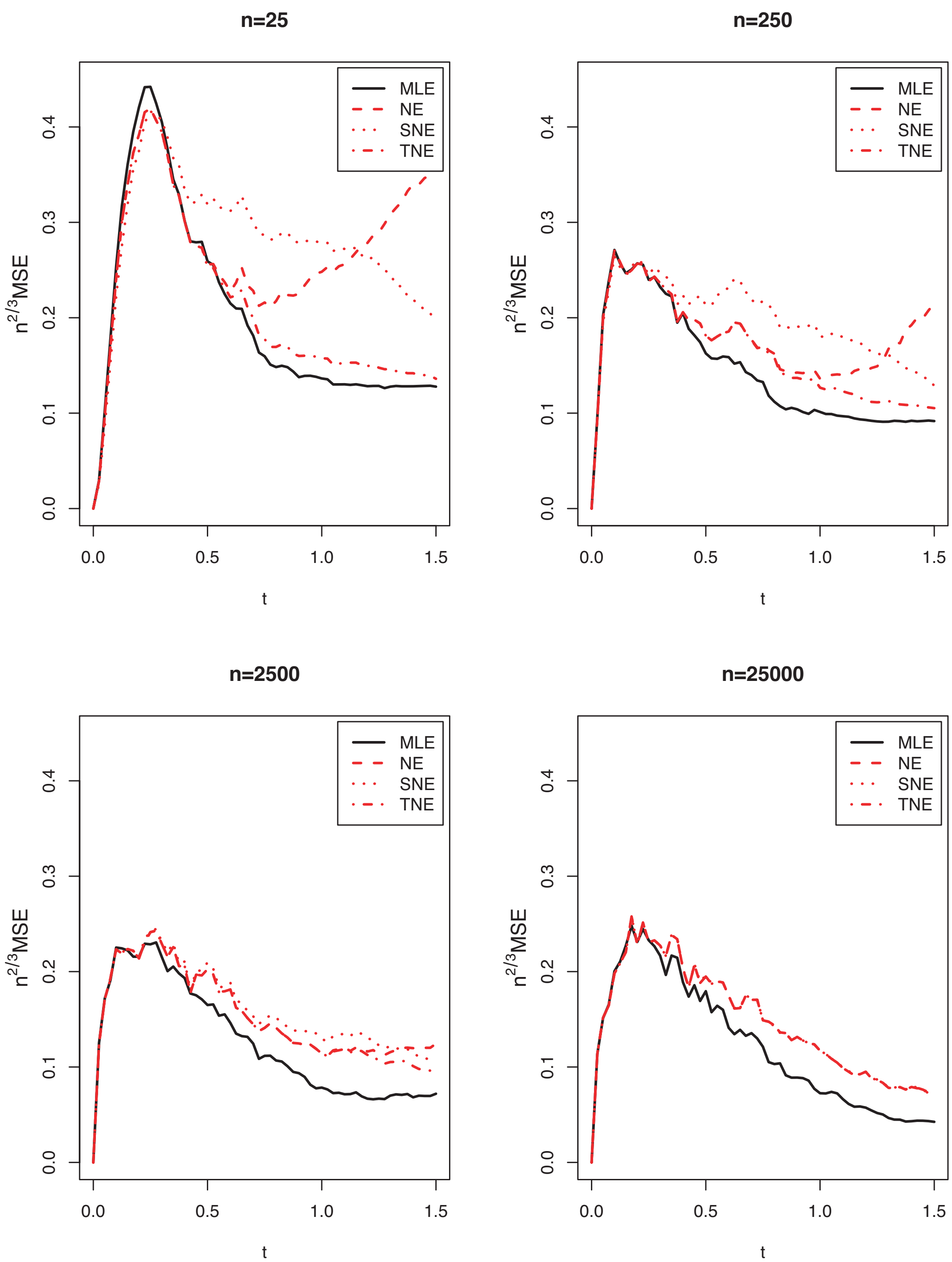

Figure 27: $n^{2/3}\times$ MSE of MLE and naive estimators of F_2