Q4.1

0.5 Points

Let $\{X_1, X_2, \cdots\}$ be i.i.d. from $N(0,1)$. What's the limit of $\frac{1}{n}\sum_{i=1}^{n} X_i^4$ as $n \to +\infty$? What's the approximate distribution of $\frac{1}{n}\sum_{i=1}^{n} X_i^4$ when n is large (don't forget to give the parameters of the distribution)? Show details.

let $Y_i = X_i^4$

$$\lim_{n\to\infty} \frac{1}{n}\sum_{i=1}^{n} E(Y_i) = \lim_{n\to\infty} \bar{Y_i} = \mu_y = \mu_{x^4}$$

(LLN)

Since LLN, when n is large, given distribution will attain normality with μ_x and σ_x^2.