2) Since the data are approximately Normally distributed:

Let X denote the students' marks.

Then $X \sim N(\mu, \sigma^2)$

with μ: population mean

σ^2: population variance.

<u>The Mean:</u>

$$\hat{\mu} = \bar{x} \simeq 13.19 \text{ (approximately)}$$
$$\sigma^2 \simeq Var(X) \simeq 8.26 \text{ (approximately)}$$

The probability density function (pdf) of a normal random variable is

$$f(x) = \frac{1}{\sqrt{2\pi\sigma^2}} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right), \quad -\infty < x < \infty$$

using the estimated mean $\hat{\mu} = 13.13.$ and variance $\sigma^2 = 8.2638$

The analytical form of the probability density is

$$f(x) = \frac{1}{\sqrt{2\pi(8.2638)}} \exp\left(-\frac{(x-13.19)^2}{2(8.2638}\right), \quad x \in \mathbb{R}$$

Thus $\boxed{f(x) \simeq \frac{1}{7.21} \exp\left(-\frac{(x-13.19)^2}{16.53}\right)}, \quad x \in \mathbb{R}$