3.2 i) $\int_{\bar{x}-a/2}^{\bar{x}+a/2} \frac{1}{a}\, dx$

$\frac{1}{a} x \Big|_{\bar{x}-a/2}^{\bar{x}+a/2}$

$\frac{1}{a}\left(\bar{x} + a/2 - \left(\bar{x} - a/2\right)\right) = 1$ ✓ está normalizado

ii) $\int_{\bar{x}-a/2}^{\bar{x}+a/2} \frac{1}{a} x\, dx$

$\frac{1}{2a} x^2 \Big|_{\bar{x}-a/2}^{\bar{x}+a/2}$

$\frac{1}{2a}\left[\left(\bar{x}^2 + \bar{x}a + \frac{a^2}{4}\right) - \left(\bar{x}^2 - \bar{x}a + \frac{a^2}{4}\right)\right]$

$\frac{1}{2a}\left[2\bar{x}a\right]$

$\bar{x}$ ✓

iii) $\sigma = \sqrt{\text{var}}$

$\text{var} = E(x^2) - E(x)^2$

$E(x^2) = \int_{\bar{x}-a/2}^{\bar{x}+a/2} \frac{1}{a} x^2\, dx$

$\frac{1}{3a} x^3 \Big|_{\bar{x}-a/2}^{\bar{x}+a/2}$

$\frac{1}{3a}\left[\left(\bar{x}^3 + \frac{3}{2}\bar{x}^2 a + \frac{3}{4}\bar{x}a^2 + \frac{a^3}{8}\right) - \left(\bar{x}^3 - \frac{3}{2}\bar{x}^2 a + \frac{3}{4}\bar{x}a^2 - \frac{a^3}{8}\right)\right]$

$\frac{1}{3a}\left[3\bar{x}^2 a + \frac{a^3}{4}\right]$

$E(x^2) = \bar{x}^2 + \frac{1}{12}a^2$

Del punto ii tenemos que $E(x) = \bar{x}$, entonces $E(x)^2 = \bar{x}^2$

$E(x^2) - E(x)^2 = \frac{1}{12}a^2 \longrightarrow \sigma = \frac{a}{\sqrt{12}}$