Exercice 20

a) $2 \ln e^3 = 2 \times 3 = \underline{\underline{6}}$

b) $\ln(1/\sqrt{e}) = -\ln(\sqrt{e}) = -\ln(e^{1/2}) = -1/2 \ln(e) = \underline{\underline{-1/2}}$.

c) $\ln(e^2) + \ln\left(\frac{1}{e^4}\right) = \ln(e^2) - \ln(e^4) = 2\ln(e) - 4\ln(e)$

$= 2 - 4 = \underline{\underline{-2}}$

Exercice 21 $\forall x \in]0; +\infty[, \quad f(x) = \frac{\ln(x)}{x}$

$f(e) = \frac{\ln(e)}{e} = \underline{\underline{\frac{1}{e}}}$

$f(e^2) = \frac{\ln(e^2)}{e^2} = \underline{\underline{\frac{2}{e^2}}}$

$f(1/e) = \frac{\ln(1/e)}{(1/e)} = \frac{-\ln(e)}{(1/e)} = e \times (-\ln(e)) = e \times (-1) = \underline{\underline{-e}}$

$f(\sqrt{e}) = \frac{\ln(\sqrt{e})}{\sqrt{e}} = \frac{1/2}{\sqrt{e}} = \frac{1}{2\sqrt{e}}$