[1] (1)
$$\frac{1}{4}\cos(1 - 2x^2) + C$$

   (2)
$$\frac{x^2}{2}\log x - \frac{x^2}{4} + C$$

[2] (1) $5/4$ (2) $-5e^{-1} + 2$

[3]

  (1)
$$f(x) = \frac{2/9}{x+1} + \frac{1/3}{(x+1)^2} + \frac{(-2/9)x - (1/9)}{x^2 + 2}$$

  (2)
$$\frac{1}{9}\{\log\frac{(x+1)^2}{x^2+2} - \frac{3}{x+1} - \frac{1}{\sqrt{2}}\tan^{-1}(\frac{x}{\sqrt{2}})\} + C$$

[4] (1) 2 (2) $\log 4$