

$$1. \int_0^2 \int_0^{z^2} \int_0^{y-z} (2x - y) dx dy dz$$

$$\begin{aligned} & \blacksquare \int_0^{y-z} 2x - y dx = \\ & \quad x^2 - xy \Big|_0^{y-z} = \\ & \quad (y-z)^2 - y^2 - yz = \\ & \quad y^2 - 2yz + z^2 - y^2 - yz = \\ & \quad -3yz + z^2 \\ & \blacksquare \int_0^{z^2} -3yz + z^2 dy = \\ & \quad \left. \frac{-3zy^2}{2} + yz^2 \right|_0^{z^2} = \\ & \quad \frac{-3z^5}{2} + z^4 \\ & \blacksquare \int_0^2 \frac{-3z^5}{2} + z^4 dz = \\ & \quad \left. \frac{-3z^6}{12} + \frac{z^5}{5} \right|_0^2 = \\ & \quad -16 + \frac{48}{5} \end{aligned}$$

$$2. \int_1^2 \int_0^{2z} \int_0^{\ln(x)} x e^{-y} dy dx dz$$

$$\begin{aligned} & \blacksquare \int_0^{\ln(x)} x e^{-y} dy = \\ & \quad x e^{-y} \Big|_0^{\ln(x)} = \\ & \quad x^2 - x \\ & \blacksquare \int_0^{2z} x^2 - x dx = \\ & \quad \left. \frac{x^3}{3} - \frac{x^2}{2} \right|_0^{2z} = \\ & \quad \frac{8z^3}{3} - \frac{4z^2}{2} \\ & \blacksquare \int_1^2 \frac{8z^3}{3} - \frac{4z^2}{2} dz = \\ & \quad \left. \frac{8z^4}{12} - \frac{4z^3}{6} \right|_1^2 = \\ & \quad \frac{8 \cdot 16}{12} - \frac{4 \cdot 8}{6} \end{aligned}$$