

$$\begin{aligned}
 V &= \int_0^7 \int_x^7 (5x^2 + 6y^2) dy dx = \int_0^7 [5x^2y + 2y^3]_{y=x}^{y=7} dx \\
 &= \int_0^7 (35x^2 + 686 - 7x^3) dx = \left[ \frac{35}{3}x^3 + 686x - \frac{7}{4}x^4 \right]_0^7 = \frac{55223}{12}
 \end{aligned}$$

