

SOLUTION OF QUIZ 7

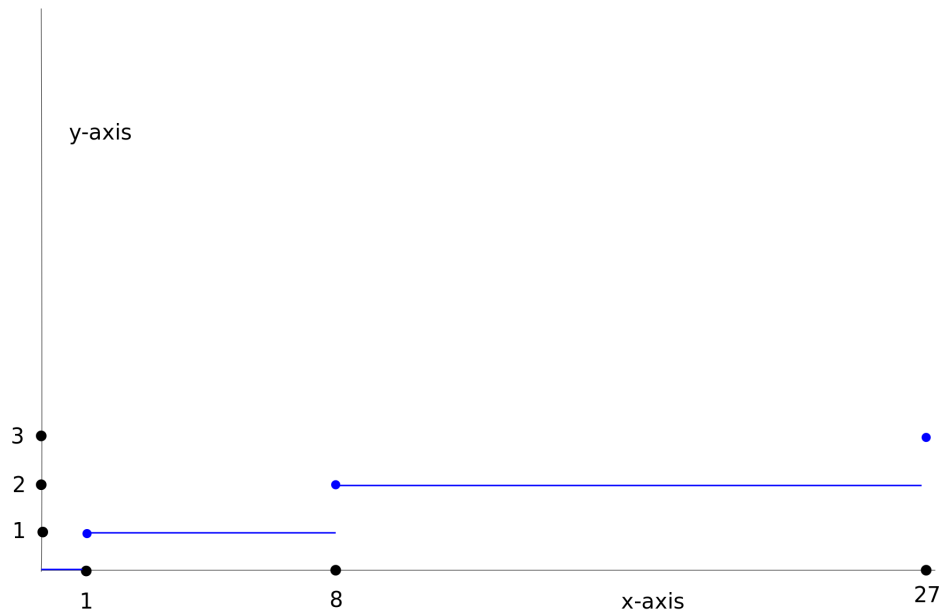
If $x \in [0, 1)$ then $x^{\frac{1}{3}} \in [0, 1)$. Therefore $[x^{\frac{1}{3}}] = 0$.

If $x \in [1, 8)$ then $x^{\frac{1}{3}} \in [1, 2)$. Therefore $[x^{\frac{1}{3}}] = 1$.

If $x \in [8, 27)$ then $x^{\frac{1}{3}} \in [2, 3)$. Therefore $[x^{\frac{1}{3}}] = 2$.

If $x = 27$ then $x^{\frac{1}{3}} = 3$. Therefore $[x^{\frac{1}{3}}] = 3$.

Hence the graph of the function $y = [x^{\frac{1}{3}}]$ in the interval $[0, 27]$ is



$$\begin{aligned} \text{Now } \int_{x=0}^{27} [x^{\frac{1}{3}}] dx &= \int_{x=0}^1 [x^{\frac{1}{3}}] dx + \int_{x=1}^8 [x^{\frac{1}{3}}] dx + \int_{x=8}^{27} [x^{\frac{1}{3}}] dx \\ &= \int_{x=0}^1 0 \, dx + \int_{x=1}^8 1 \, dx + \int_{x=8}^{27} 2 \, dx \\ &= 45 \end{aligned}$$