Nama : Muchammad Daniyal kautsar
NIM : 21/479067/TK/52800

Quiz 1 Tutorkut

1. $\int_2^5 f(x)\,dx = 4$; $\int_{-2}^5 f(x)\,dx = 3$; $\int_{-2}^5 g(x)\,dx = 9$

$$\int_{-2}^5 (f(x)+g(x))\,dx = \int_{-2}^5 f(x)\,dx + \int_{-2}^5 g(x)\,dx$$

$$= 3 + 9 = 12$$

2. $\lim_{n\to\infty} \frac{1}{n^2}(2+4+6+\dots+2n) = \lim_{n\to\infty} \frac{\frac{(2n+2)\cdot n}{2}}{n^2} = \lim_{n\to\infty} \frac{n^2+n}{n^2}$

$$= \lim_{n\to\infty} \frac{n+1}{n}$$

$$= 1$$

3. $x_1 = 0 \quad x_2 = 6$
$y_1 = 0 \quad y_2 = 6$
$x^{\frac{1}{2}} + y^{\frac{1}{2}} = \sqrt{6}$

$$\sqrt{y} = \sqrt{6} - \sqrt{x}$$
$$y = (\sqrt{6} - \sqrt{x})^2$$
$$V = \int_0^6 (\sqrt{6}-\sqrt{x})^4\,dx$$
$$V = \int_0^6 \left(x + 6 - 2\sqrt{6}\sqrt{x}\right)^2 dx$$
$$= \int_0^6 x^2 + 12x - 36\sqrt{6}\sqrt{x} + 36 + 24x + 24\sqrt{6}\sqrt{x}\,x\,dx$$
$$= \int_0^6 x^2 + 36x + 36 + 24\sqrt{6}\sqrt{x}\,x - 36\sqrt{6}\sqrt{x}\,dx$$
$$= \frac{1}{3}x^3 + 18x^2 + 36x + \frac{4}{5}\sqrt{6}\,x^{5/2} - 24\sqrt{6}\,x^{3/2}\Big|_0^6$$
$$= \frac{6^3}{3} + 18\cdot 6^2 + 36\cdot 6 + \frac{4\sqrt{6}}{5}6^{5/2} - 24\sqrt{6}\cdot 6^{3/2}$$
$$= 249\frac{4}{5}$$