Tugas 3

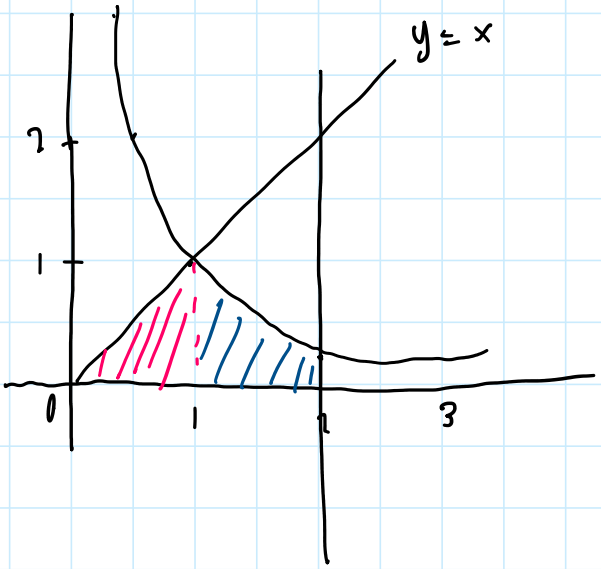
Saturday, 18 September 2021 16.04

1. Tentukan luas grafik dibatasi oleh 3 kurva dan garis berikut.

$y = x$

$y = \frac{1}{x^2}$

$x = 2$



Batas : $0 \rightarrow 2$

luas bangun pertama

$$A_1 = \int_0^1 x \, dx$$

$$= \frac{1}{2} x^2 \Big]_0^1 = \frac{1}{2} - 0 = \frac{1}{2}$$

luas bangun kedua

$$A_2 = \int_1^2 \frac{1}{x^2}\, dx$$

$$= \int_1^2 x^{-2}\, dx = -x^{-1} \Big]_1^2$$

$$= -\frac{1}{2} + 1$$

$$= \frac{1}{2}$$

$$A_1 + A_2 = \frac{1}{2} + \frac{1}{2} = 1 \;//$$

2. Hitung integral berikut

$$\int \frac{gr^2}{\sqrt{1-r^3}}\, dr$$

$$\int g r^2 (1-r^3)^{-\frac{1}{2}}\, dr$$

$u = 1 - r^3$

$du = 3r^2\, dx \longrightarrow dx = \frac{du}{3r^2}$

$= \int 9r^2 \, u^{-\frac{1}{2}} \frac{du}{3r^2}$

$= \int 3 u^{-\frac{1}{2}} du$

$= 2 \cdot 3 \, u^{\frac{1}{2}} + C$

$= 6\sqrt{1 - r^3} + C$

13 $\int_0^5 e^{-2x} \, dx$; Tentukan nilai berikut.

$= \frac{1}{-2} e^{-2x} \Big]_0^5$

$= -\frac{1}{2} \cdot e^{-10} + \frac{1}{2(1)} = \frac{1}{2}\left(-\frac{1}{e^{10}} + 1\right)$