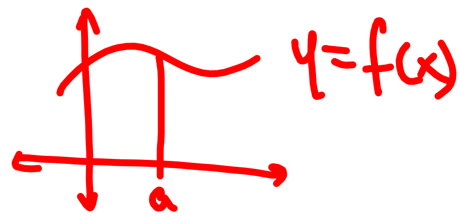
Evaluate

1) $\int_2^2 x\,dx = \frac{x^2}{2}\Big]_2^2 = \frac{(2)^2}{2} - \frac{(2)^2}{2} = 0$

$\int_a^a f(x)\,dx = 0$



2a) $\int_{-1}^{3} x\,dx$

2b) $\int_{3}^{-1} x\,dx$

$= \frac{x^2}{2}\Big]_{-1}^{3} = \frac{3^2}{2} - \frac{(-1)^2}{2}$

$= \frac{9}{2} - \frac{1}{2}$

$= 4$

$= \frac{x^2}{2}\Big]_{3}^{-1} = \frac{(-1)^2}{2} - \frac{3^2}{2}$

$= -\frac{8}{2} = -4$

$\int_a^b f(x)\,dx = -\int_b^a f(x)\,dx$

3a) $\int_{-2}^{1} x\,dx$

$= \frac{x^2}{2}\Big]_{-2}^{1} = \frac{(1)^2}{2} - \frac{(-2)^2}{2}$

$= -\frac{3}{2}$

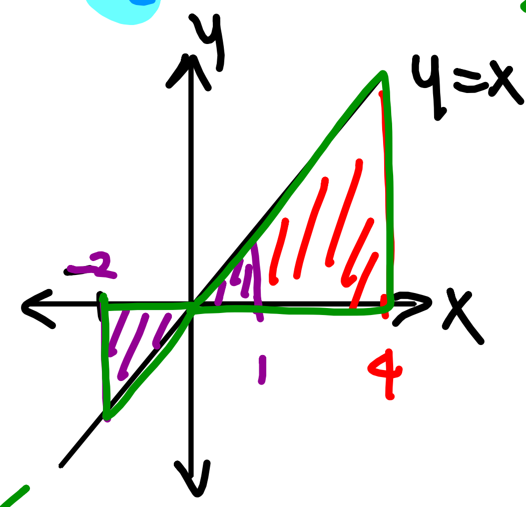
+

3b) $\int_{1}^{4} x\,dx$

$= \frac{x^2}{2}\Big]_{1}^{4} = \frac{4^2}{2} - \frac{1^2}{2}$

$= \frac{15}{2}$

3c) $\int_{-2}^{4} x\,dx = \frac{x^2}{2}\Big]_{-2}^{4} = \frac{4^2}{2} - \frac{(-2)^2}{2} = \frac{12}{2}$



$$\int_a^b f(x)\,dx + \int_b^c f(x)\,dx = \int_a^c f(x)\,dx$$

4a) $\int_{0}^{\pi/2} \sin x\,dx$

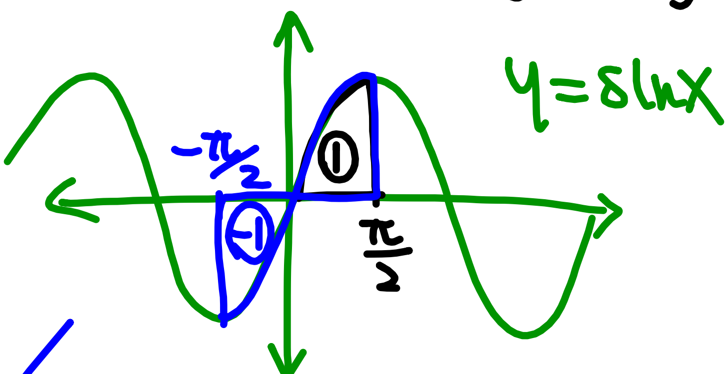
4b) $\int_{-\pi/2}^{\pi/2} \sin x\,dx$

$$= -\cos x \Big]_{0}^{\pi/2} = \left(-\cos\frac{\pi}{2}\right) - \left(-\cos 0\right)$$

$$= 0 - (-1) = 1$$

$$= -\cos x \Big]_{-\pi/2}^{\pi/2}$$

$$= 0 - 0 = 0$$

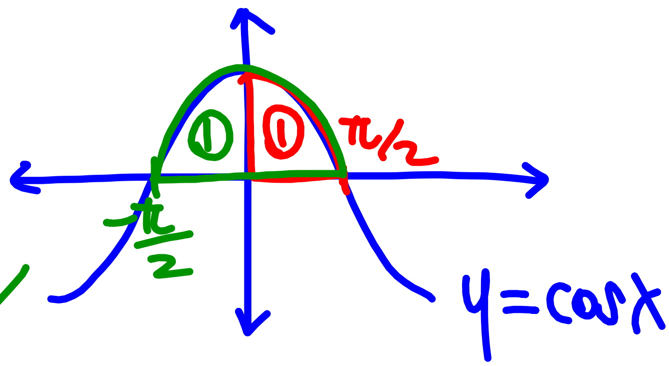


If $f(-x) = -f(x)$,

$$\int_{-a}^{a} f(x)\,dx = 0$$

5a) $\int_0^{\pi/2} \cos x \, dx = 1$

5b) $\int_{-\pi/2}^{\pi/2} \cos x \, dx = 2$



If $f(-x) = f(x)$

$$\int_{-a}^{a} f(x)\,dx = 2\int_{0}^{a} f(x)\,dx$$