Actividad

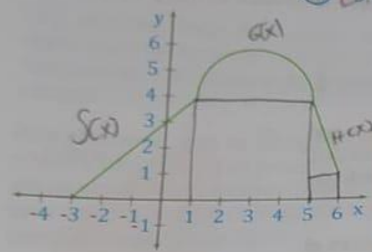
1 Observa y determina el área de la región limitada por el eje x, y la gráfica de la función en el intervalo que se indica.

ⓐ ~~[-3, 0]~~ $-3, 1$

ⓑ ~~[-3, 0]~~ $1, 5$

ⓒ ~~[-3, 0]~~ $5, 6$

ⓓ ~~[-3, 0]~~



$F(x) = x + 3$

$g(x) = \sqrt{4-(x-3)^2} + 4$

$H(x) = -3x + 19$

$(\int_{-3}^{1} f(x)dx) + (\int_{1}^{5} g(x)dx) + (\int_{5}^{6} H(x)dx)$

$\int_{-3}^{1} x+3\,dx + \int_{1}^{5} \sqrt{4-(x-3)^2}+4\,dx + \int_{5}^{6} -3x+19\,dx$

$\int_{-3}^{1}(x+2)dx + \int_{1}^{5}\sqrt{4-(x-3)^2} dx) + 4x\Big|_{5}^{5} + \left(\frac{(-3x)^2}{2} + 19x\right)\Big|_{5}^{6}$

$\frac{x^2}{2} + 3x \Big| (\int_{1}^{5}\sqrt{4-(x-3)} dx) + 2 \cdots \left(\frac{x-3}{2}\right))]^{5} + 16 + 2$

$(8) + (\sqrt{1-(x-3)^2}(x-3)$

$8 + 6,28) + 16 + 2,5$

$F(x) + G(x) + H(x) = 32,7857$

2 Halla cada integral si $\int_1^3 [\, g(x)\, dx = -5$, $\int_1^7 f(x)\, dx = 3$, $\int_1^3 g(x)\, dx = 6$ y $\int_3^7 g(x)\, dx = -3$.

ⓐ $\int_1^7 5\left(f(x) - \frac{1}{2} g(x)\right) dx$

ⓑ $\int_1^7 (-2 f(x) + 6\, g(x))\, dx$

ⓒ $\int_1^7 3(f(x) + g(x))\, dx$

a. $5\int_1^7 (F(x) - \frac{1}{2} g(x))dx$

$= 5[\int_1^7 F(x)dx - \frac{1}{2}\int_1^7 g(x dx]$

$= 5[3 - \frac{1}{2}(\int_1^3 g(x)dx + \int_3^7 g(x)dx)]$

$= 5[3 - \frac{1}{2}(-5-3)$

$= 5[3 - \frac{1}{2}(-8)]$

$= 5[3+4]$

$= 5 \cdot 7 = 35$

b. $\int_1^7 -2F(x)dx + \int_1^7 6g(x)dx$

$= -2\int_1^7 F(x)dx + 6\int_1^7 g(x)dx + \int_1^3 g(x)dx$

$= -6 + 6((-5)+(-3))$

$= -6 + 6(-8)$

$= -6 - 48$

$= -54$

c. $3\int_1^7 (F(x) + g(x))dx$

$= 3[3 + (\int_1^3 g(x)dx + \int_3^7 g(x)dx)]$

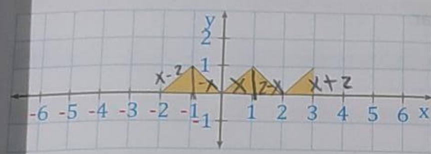
$= 3[3 + (-5-3)$

$= 3[3 + (-8)$

$= 3[-5]$

$= 3 \cdot (-5) = -15$

3 Escribe como una integral, la representación del área bajo cada curva dada. Luego, calcula si es posible la integral.

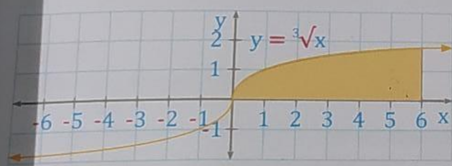


$\int_{-2}^{-1} f(x)dx + \int_{-1}^{0} g(x)dx + \int_{0}^{1} H(x)dx + \int_{1}^{2} J(x)dx \int_{2}^{3} M(x)dx$

$= \frac{x^2}{2} - 2x\Big|_{-1}^{-2} + \frac{-x^2}{2}\Big|_{-1}^{0} + \frac{x^2}{2}\Big|_{0}^{1} + 2x - \frac{x^2}{2}\Big|_{1}^{2} + \frac{x^2}{2} + 2x\Big|_{2}^{3}$

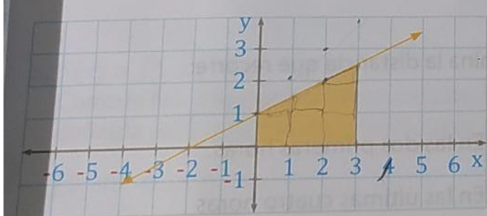
$= 0,5 + 0,5 + 0,5 + 0,5 + 0,5$

$= 2,5$



$\int_{0}^{6} G(x)dx = \int_{0}^{6} (x)^{\frac{1}{3}}dx = \frac{3(x)^{\frac{4}{3}}}{4}\Big|_{0}^{6}$

$\int_{0}^{6} g(x)dx = \frac{3(6)^{\frac{4}{3}}}{4} = 8,1770$



$f(x) = \frac{1}{2}x + 1$

$\int_{0}^{3} f(x)dx \to \int_{0}^{3} (\frac{1}{2}x + 1)dx$

$\frac{x^2}{4} + x\Big|_{0}^{3}$

$\frac{9}{4} + 3 = \frac{27}{4}$