#12 (a) $F(3) = \int_3^3 f(t)\,dt = 0$

(b) $F(0) = \int_3^0 f(t)\,dt = -\left(3 + \frac{9}{4}\pi\right)$

(c) $F(-5) = \int_3^{-5} f(t)\,dt = -\left(\frac{9}{2}\pi + 6\right)$

(d) $F(4) - F(2) = \int_3^4 f(t)\,dt - \int_3^2 f(t)\,dt$

$= \int_2^3 f(t)\,dt + \int_3^4 f(t)\,dt = \int_2^4 f(t)\,dt$

$\approx 2 + 1.2 = 3.2$

(e) $F(6) - F(0)$

$\int_0^3 f(t)\,dt + \int_3^6 f(t)\,dt - \cancel{\int_3^0 f(t)\,dt} = \int_0^6 f(t)\,dt$

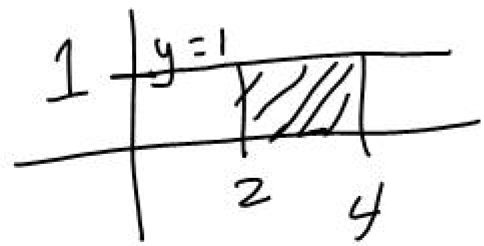
$= \frac{9}{4}\pi + 5$

#12 $\displaystyle\int_4^6 g(x-2)\,dx = \int_2^4 g(x)\,dx = 5$

2 to the left

#13 $\displaystyle 5\int_4^2 g(x)\,dx - \int_4^2 1\,dx$

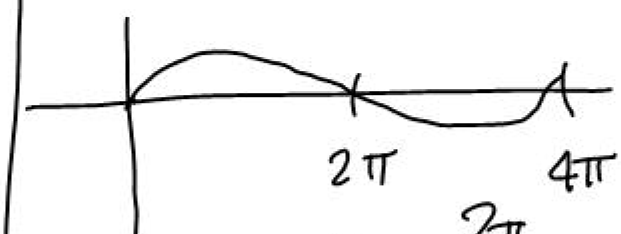
$\displaystyle = -5\int_2^4 g(x)\,dx + \int_2^4 1\,dx$



$= -5(5) + 2$

$= -23$

$f(x) = \sin\left(\frac{1}{2}x\right)$



$P = \dfrac{2\pi}{1/2}$

$= 4\pi$

#14 $\displaystyle\int_8^{18} f\left(\frac{x}{2}\right)dx$

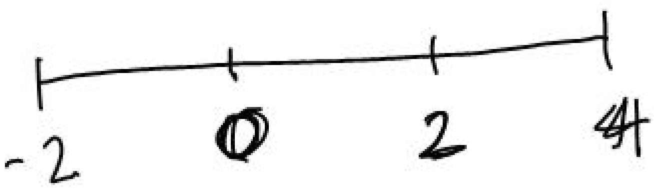
$\displaystyle = \int_4^9 f(x)\,dx = -2$

$\boxed{\#5}$ $\int_{-2}^{4} x^2\,dx$ $\qquad \int_a^b f(x)\,dx$ $\qquad \Delta x = \frac{b-a}{n}$

(a) RH $n=3$ $\quad \Delta x = \frac{4 - -2}{3} = 2$

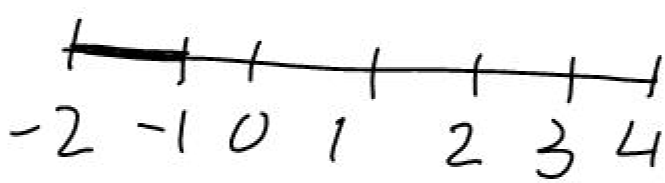
$$\int_{-2}^{4} x^2\,dx \approx 2\left[0^2 + 2^2 + 4^2\right] = 40$$

$$\frac{40+16}{2} = 28$$



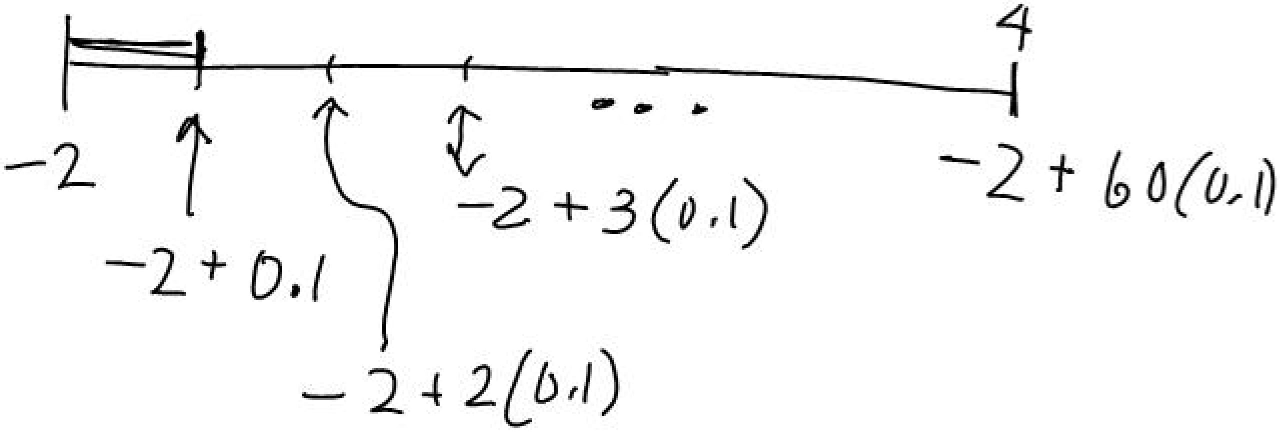
(b) $\int_{-2}^{4} x^2\,dx \approx 2\left[(-2)^2 + 0^2 + 2^2\right] = 16$

(c) RH $n=6$



$$\int_{-2}^{4} x^2\,dx \approx 1\left[(-1)^2 + 0^2 + 1^2 + 2^2 + 3^2 + 4^2\right] = 31$$

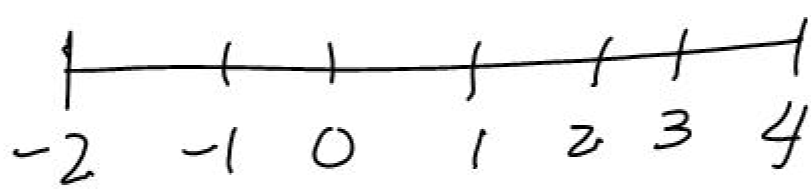
(d) RH $n=60$ $\Delta x = \frac{4 - -2}{60} = \frac{1}{10}$



[d ½] L-H Riemann Sum ($n=60$)

[e] RH $n=600$ $\Delta x = \frac{4 - -2}{600} = \frac{1}{100}$

(f) Trapezoids ($n=6$)



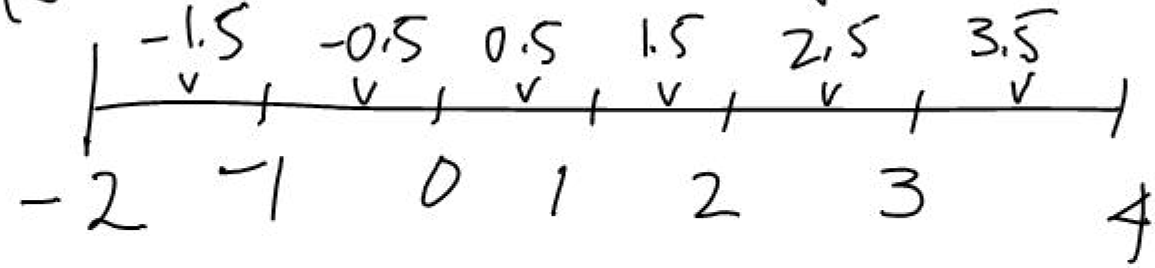
$$\int_{-2}^{4} x^2\,dx \approx \frac{1}{2} \cdot 1 \left[(-2)^2 + 2(-1)^2 + 2(0)^2 + 2(1)^2 + 2(2)^2 + 2(3)^2 + 4^2\right]$$

trap. formula

Δx

$= 25$

(g) 6 Midpoint rectangles



Δx

$\downarrow$

$$1\left[(-1.5)^2+(-0.5)^2+(0.5)^2+(1.5)^2+(2.5)^2+(3.5)^2\right]$$

HW #6 - 9 (ignore Simpson's)