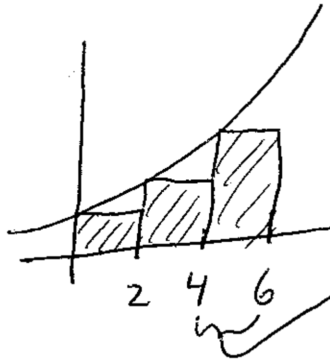
1.) Approximate $\int_0^6 e^x dx$ using



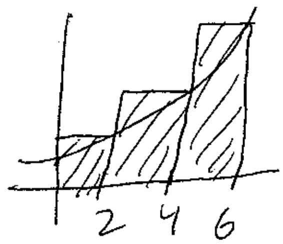
(a) 3 inscribed rectangles of equal width.

$e^0(2) + e^2(2) + e^4(2)$

$= \boxed{2 + 2e^2 + 2e^4}$

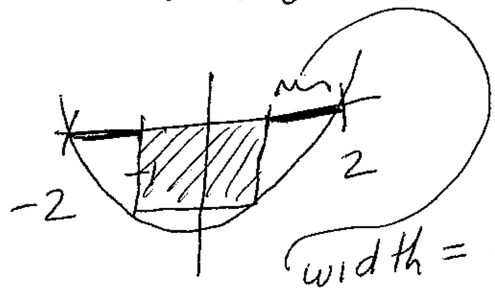
width $= \frac{6}{3} = 2$

(b) 3 circumscribed rectangles of equal width.



$\boxed{2e^2 + 2e^4 + 2e^6}$

2.) Approximate $\int_{-2}^{2}(x^2-4)dx$ using



(a) 4 inscribed rectangles of equal width.

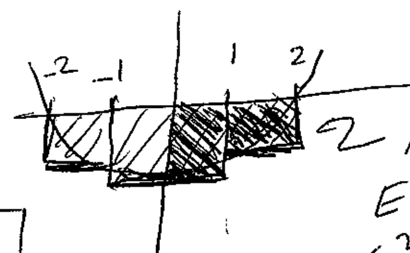
$(0)(1) + (-3)(1) + (-3)(1) + (0)(1)$

$= 2(-3) = \boxed{-6}$

width $= \frac{2-(-2)}{4}$

$= \frac{4}{4} = 1$

(b) 4 circumscribed rectangles of equal width.



$\cancel{2(-4)+2(}$

$2[(-4)(1) + (-3)(1)] = \boxed{-14}$

NOTE EVEN FUNCTION

$\int_{-2}^{2}(x^2-4)dx = 2\int_0^2 (x^2-4)dx$

3.) Approximate $\int_0^{\frac{\pi}{2}} cos(x)dx$ using

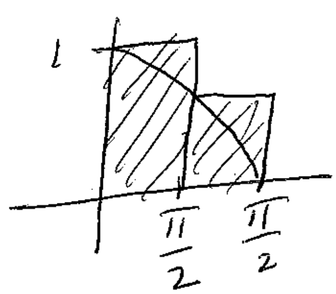
(a) 2 inscribed rectangles of equal width.

$\cos\left(\frac{\pi}{4}\right) \cdot \frac{\pi}{4} + 0 \cdot \frac{\pi}{4}$

$= \frac{\sqrt{2}}{2} \cdot \frac{\pi}{4} = \boxed{\frac{\pi\sqrt{2}}{8}}$

width $= \frac{\pi/2}{2} = \frac{\pi}{4}$

(b) 2 circumscribed rectangles of equal width.



$\cos(0) \cdot \frac{\pi}{4} + \cos\left(\frac{\pi}{4}\right) \cdot \frac{\pi}{4}$

$= \frac{\pi}{4} + \frac{\sqrt{2}}{2} \cdot \frac{\pi}{4} = \boxed{\frac{(2+\sqrt{2})\pi}{8}}$