

1. Find the anti derivative

(a) $f(x) = (x + 1)^2(x + 2) + (x + 1)(x + 2)^2$

$$F(x) = \frac{1}{2} (x+1)^2 (x+2)^2 + C$$

(b) $g(x) = x \sin(x^2)$

$$G = -\cos(x^2) + C$$

2. Approximate the area under the curve $f(x) = x^2(6 - x)$ on $[0, 4]$ with $n = 3$ using

(a) Left endpoints

x	0	4/3	8/3	4
$f(x)$	0	$\frac{16}{9}(6 - \frac{4}{3})$	$\frac{64}{9}(6 - \frac{8}{3})$	32

$$L = \frac{4}{3} \cdot 0 + \frac{4}{3} \cdot \frac{16}{9} (6 - \frac{4}{3}) + \frac{4}{3} \cdot \frac{64}{9} (6 - \frac{8}{3})$$

~~$= \frac{4}{3} \cdot \frac{16}{9} (6 - \frac{4}{3}) + \frac{4}{3} \cdot \frac{64}{9} (6 - \frac{8}{3})$~~

(b) Right endpoints

$$R = \frac{4}{3} \cdot \frac{16}{9} (6 - \frac{4}{3}) + \frac{4}{3} \cdot \frac{64}{9} (6 - \frac{8}{3}) + \frac{4}{3} \cdot 32$$