

Ex 1) Find avg value of
 $f(x) = 3x^2 - 2x$ on $[1, 4]$.

$$\begin{aligned} & \frac{1}{4-1} \cdot \int_1^4 (3x^2 - 2x) dx \\ &= \frac{1}{3} \cdot \left[x^3 - x^2 \Big|_1^4 \right] \\ &= \frac{1}{3} [(64 - 16) - (1 - 1)] \\ & \quad \frac{1}{3} (48) = 16 \end{aligned}$$

Ex 2) Use MVT for integrals
to find $f(c)$ and c for $f(x) = 2x^2$
over $[0, 3]$.

$$\begin{aligned} & \frac{1}{3-0} \cdot \int_0^3 2x^2 dx \\ &= \frac{1}{3} \left[\frac{2}{3} x^3 \Big|_0^3 \right] = \frac{1}{3} [18 - 0] \end{aligned}$$

$$f(c) = 6$$

$$2x^2 = 6$$

$$x = \pm \sqrt{3}$$

$$c = \sqrt{3}$$