

Øving 12  
Gruppe 3.

MA0001

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Oppgave 7.

a)

$$\int_1^3 2 - x + 2\sin(x) - x \cos(x) dx$$

Midtpunktreglen:

$$\int_a^b f(x) dx \approx M_n = \delta (f(c_1) + f(c_2) + \dots + f(c_n))$$

$$\delta = \frac{b-a}{n}, \quad c_k = a + \delta \left(k - \frac{1}{2}\right)$$

oppgaven gir  $a=1$ ,  $b=3$  og  $N=4$

Detta gir

$$\delta = \frac{3-1}{4} = \frac{1}{2}$$

$$c_k = 1 + \frac{1}{2} \left(k - \frac{1}{2}\right), \quad c_1 = \frac{5}{4}$$

$$c_2 = \frac{3}{2}$$

$$c_3 = \frac{7}{4}$$

$$c_4 = \frac{9}{4}$$

$$f\left(\frac{5}{4}\right) = 2 - \frac{5}{4} + 2\sin\left(\frac{5}{4}\right) - \frac{5}{4} \cos\left(\frac{5}{4}\right) \approx 2,254$$

$$f\left(\frac{3}{2}\right) \approx 2,53$$

$$f\left(\frac{7}{4}\right) \approx 2,72$$

$$f\left(\frac{9}{4}\right) \approx 2,55$$

legger disse sammen og får 10.06

$$M_n = \frac{1}{2} \cdot 10.06 \approx \underline{\underline{5}}$$