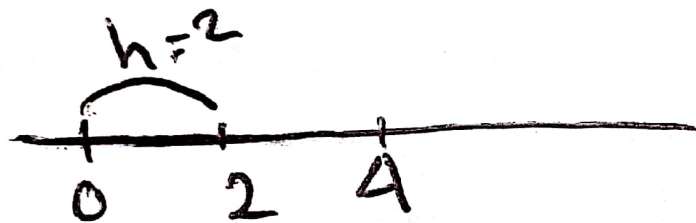


$$\textcircled{1} \quad a = 0 \quad h = \frac{b-a}{n} = \frac{2-0}{256}$$

$$b = 2$$



a. ~~metode~~ kaidah trapesium

$$I = \frac{h}{2} \cdot (f_0 + 2f_1)$$

$$= \frac{2}{2} \cdot (0 + 2 \cdot 0) = 0$$

b. kaidah simpson  $\frac{1}{3}$

$$I = \frac{h}{3} \cdot (f_0 + 4f_1) = \frac{2}{3} \cdot (0 + 4 \cdot 0) = 0$$

Table ~~Kaldata~~ Soal 1

$h$	$F(h) = (4h - h^3) \exp(h^2)$	$F_i$
0	$= (4 \cdot 0 - 0^3) \cdot \exp(0^2) = 0$	$F_0$
2	$= (4 \cdot 2 - 2^3) \cdot \exp(2^2) = 0$	$F_1$

# ① c) Kaidah titik tengah

$$a=0$$

$$b=2$$

$$h=2$$

$$n=256$$

$$h \times 0.5 = 2 \times 1.5 = 1.5$$

berakhir di 1.5

$$\int_a^b f(x) dx \approx h \sum_{i=0}^{n-1} f_i + \frac{1}{2}$$

i	x	f(x)
1/2	1	8.1548
1 1/2	3	-12.154
2 1/2	5	-75605
Total		-75605
Hampiran		-15121

② A) Kaidah Trapezium

$$a = 1.5 \quad n = \frac{b-a}{h} = \frac{2.5 - 1.5}{0.1} = 10$$

$$b = 2.5$$

$$h = 0.1$$

$$N = 10$$

$$\int_{1.5}^{2.5} x^2 \cos(x^2) \approx \frac{h}{2} (f_0 + \sum_{i=1}^{n-1} f_i + f_n)$$

$$\approx \frac{0.1}{2} (-1.4133 + 2(-2.1391 + -2.7990 + \dots + 4.9894) + 6.2465) = \underline{\underline{-0.4400}}$$

② B) Kaidah Simpson  $\frac{1}{3}$

$$I = \frac{h}{3} (f_0 + 4f_1 + 2f_2 + 4f_3 + 2f_4 + 4f_5 + 2f_6 + 4f_7 + 2f_8 + 4f_9 + 6.2465)$$

$$\approx \frac{0.1}{3} (1.5 + 4 \cdot -2.1391 + 2 \cdot -2.7990 + 4 \cdot -3.2243 + 2 \cdot -3.2211 + 4 \cdot -2.6145 +$$

$$2 \cdot -1.3133 + 4 \cdot 0.6159 + 2 \cdot 2.888 + 4 \cdot 4.9894 + 6.2465)$$

$$\approx 1.5 + -8.5564 + -5.598 + -12.8972 + -6.4422 + -10.458 + -2.6266 +$$

$$2.4636 + 5.776 + 19.9576 + 6.2465 = \underline{\underline{-10.6347}}$$

i	x	f(x)	Nilai trapezium
f <sub>0</sub>	1.5	-1.4133	-0.4400
f <sub>1</sub>	1.6	-2.1391	
f <sub>2</sub>	1.7	-2.7990	
f <sub>3</sub>	1.8	-3.2243	
f <sub>4</sub>	1.9	-3.2211	
f <sub>5</sub>	2	-2.6145	
f <sub>6</sub>	2.1	-1.3133	
f <sub>7</sub>	2.2	0.6159	
f <sub>8</sub>	2.3	2.8884	
f <sub>9</sub>	2.4	4.9894	
f <sub>10</sub>	2.5	6.2465	



② C. Kuda-kuda panjang

$$a = 1.5$$

$$b = 2.5$$

$$h = 0.1$$

$$n = 10$$

$$n = \frac{b-a}{h} = \frac{2.5-1.5}{0.1} = 10$$

berakhir di  $9.5 (9 \frac{1}{2})$

i	x	f(x)
$\frac{1}{2}$	1.54	-1.7026
$1\frac{1}{2}$	1.64	-2.4195
$2\frac{1}{2}$	1.74	-3.0079
$3\frac{1}{2}$	1.84	-3.2853
$4\frac{1}{2}$	1.94	-3.0587
$5\frac{1}{2}$	2.04	-2.1780
$6\frac{1}{2}$	2.14	-0.6063
$7\frac{1}{2}$	2.24	1.5077
$8\frac{1}{2}$	2.34	3.7849
$9\frac{1}{2}$	2.44	5.6331
Total		-5.3325
Hampiran		-0.5332

$$x_{1/2} = 1.5 + (0.1/2.5) = 1.54$$

$$1.54^2 \cdot \cos(1.54^2) = -1.7026$$

$$f_0 \rightarrow f_9 = -1.7026 + -2.4195 + -3.0079 \dots + 5.6331 = -5.3325$$

$$h \cdot \text{Total} = 0.1 \cdot -5.3325 = -0.5332$$

3. (A)

\*  $F'(1.2)$ 

$$F'_0 = \frac{F_1 - F_{-1}}{2h} + O(h^2) \approx \frac{0.36143 - 0.36329}{2(0.1)} \approx -1.455$$

hampiran  $F'(1.2)$  adalah  $-1.455$

\*  $F''(1.2)$ 

$$F''_0 = \frac{F_1 - 2F_0 + F_{-1}}{h^2} + O(h^2)$$

$$\approx \frac{0.36143 - 2(0.36236) + 0.36329}{0.001^2}$$

$$\approx \frac{0.36143 - 0.72472 + 0.36329}{1000.000} \approx -0.363$$

Ⓑ jika dibandingkan antara penarikan kedua tersebut, lebih baik yang cara  $F''(1.2)$ , walaupun jumlah titik lebih banyak, tetapi hasilnya lebih kecil dari  $F'(1.2)$

2.

kaidah trapesium

$$\int_a^b f(x) dx \approx \frac{h}{2} \left( f_0 + 2 \sum_{i=1}^{n-1} f_i \right)$$

$$a = 1.5$$

$$n = \frac{b-a}{h}$$

$$= \frac{2.5 - 1.5}{0.1} = 10$$

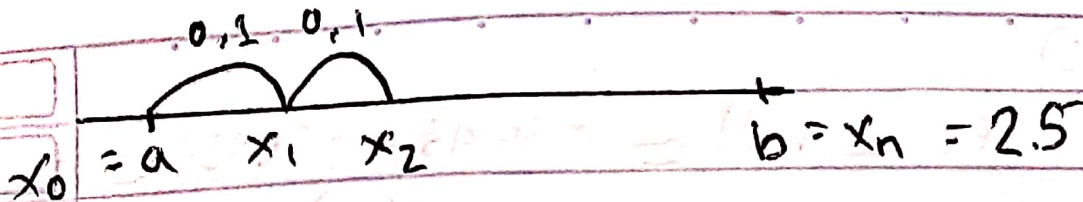
$$b = 2.5$$

$$h = 0.1$$

$$h = 0.1$$

$$n = 10 \text{ trapesium}$$





$$f(x) = \cos(x^2) \rightarrow f_0 = \cos x_0^2$$

$$\int_a^b f(x) dx = \int_{1,5}^{2,5} x_0^2 \cos(x_0^2) \approx \frac{h}{2} \left( f_0 + \sum_{i=1}^{n-1} f_i + f_n \right)$$

$$\approx \frac{0,1}{2} \left( 0,9992 + 2(0,999 + 0,9987 + 0,9984 + \dots + 0,995) + 0,9941 \right)$$

$$\left[ \int_{1,5}^{2,5} x_0^2 \cos(x_0^2) \approx 1,49285 \right] \left\{ \begin{array}{l} \cos(2,5^2 - 1,5^2) \\ \approx 0,9976 \end{array} \right.$$

$$\text{error} = |1,49285 - 0,9976| = 0,49525$$

indek(i)	$x_i$	$f_i$	nilai trapesium
0	1,5	0,9992	1,49285
1	1,6	0,999	
2	1,7	0,9987	
3	1,8	0,9984	0,9976
4	1,9	0,998	
5	2	0,9976	
6	2,1	0,997	
7	2,2	0,9964	
8	2,3	0,9957	
9	2,4	0,995	
10	2,5	0,9941	
11			