SORU-2

Devir sayısı = $f(v) = v^4 - 4v^3 + 3v^2 - 20v - 100$

a = 1
b = 20
epsilon = 0,05

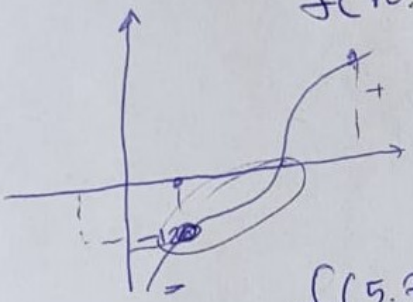
$f(1) = 1 - 4 + 3 - 20 - 100$

$f(1) = -120$ (-)

$f(20) = 136.700$ (+)

$\frac{a+b}{2} = 10.5$

$f(10.5) = 7.545,3125$ (+)



a = 1
b = 10.5

$\frac{a+b}{2} = 5.75$

$f(5.75) = 216,878$

a = 1
b = 5.75

$\Rightarrow \frac{a+b}{2} = 3,375$

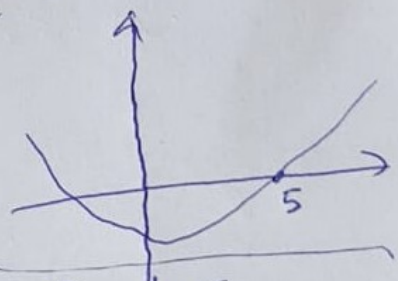
$f(3.375) = -157,3167$

a = 3.375
b = 5.750

$\Rightarrow \frac{a+b}{2} = 4,5625$

$f(4.5625) = -75,378$

a = 4.5625
b = 5.75



Bu yöntem ile devam edildiğinde
5 gerilim değerinde devir sayısı 5 olur

$v^4 - 4v^3 + 3v^2 - 20$

V = 5
Devir sayısı ≠ 0

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SORU-3

x	y
1	-120
1.25	-125.683
1.5	-131.687
1.75	-137.871
2	-144
2.25	-149.746
2.5	-154.687
2.75	-158.308
3	-160

a) $n=8$ için Simpson

$$\frac{0.25}{3}[-120-160+4*(-125.683-137.871-149.746-158.308)$$

$$= -285.535$$

b) Gerçek integral hesabı

$$-285.6$$

Bağıl Hata ise

$$= \frac{-285.6-285.535}{285.6} \times 100$$

Bağıl Hata. % 0.022

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SORU-4

x	z	f(x)	Δf(x)	Δ²f(x)
2	0	3	20	+16
4	1	23	36	+16
6	2	59	52	+16
8	3	111	68	+16
10	4	179	84	+16
12	5	263		

z	x	Δx
0	2	2
1	4	2
2	6	2
3	8	2
4	10	2
5	12	2

$$x = f(z) = x_0 + z.\Delta x$$

$$x = 2 + 2.z$$

$$z = \frac{x-2}{2}$$

$$x = 9 \Rightarrow z = \frac{9-2}{2}$$

$$\boxed{z = 3,5}$$

$$f(z) = f_0 + z.\Delta f_0 + \frac{z(z-1)}{2}.\Delta^2 f_0$$

$$3 + 20z + 16.\frac{z(z-1)}{2}$$

$f(z) = 8z^2 + 12z + 3 \rightarrow$ Ara interpolasyon

$$f(x) = 8\left(\frac{x-2}{2}\right)^2 + 12\left(\frac{x-2}{2}\right) + 3$$

$z = 3,5$

$$f(x) = 8.(3,5)^2 + 12(3,5) + 3$$

$$\boxed{f(x) = 143}$$