

Name: Farah Jasmin Khan

ID: 19101239

Section: 06.

Quiz-7

Ques#9

Paper Source

Subject

Date

Time

As ID = 19101239 which is  
ODD.

$$f(x) = x^2 - 5x + 6$$

$$f'(x) = 2x - 5$$

$$\text{We know, } x_{k+1} = x_k - \frac{f(x_k)}{f'(x_k)}$$

$$x_{k+1} = x_k - \frac{x^2 - 5x + 6}{2x - 5}$$

$$x_1 = 1$$

$$f(x_1) = 1^2 - 5 \cdot 1 + 6 \\ = 1 - 5 + 6 = 2$$

$$f'(x_1) = 2 \cdot 1 - 5 = 2 - 5 = -3$$

$$x_2 = 1 - \frac{2}{-3} = 1.667$$

$$x_2 = 1.667$$

$$f(x_2) = (1.667)^2 - 5 \cdot (1.667) + 6 \\ = 0.444$$

$$f'(x_2) = 2 \cdot (1.667) - 5 \\ = -1.666$$

$$x_3 = 1.667 - \frac{0.444}{-1.666} \\ = 1.9335$$

$$x_3 = 1.9335$$

$$f(x_3) = (1.9335)^2 - 5(1.9335) + 6 = 0.071$$

$$f'(x_3) = 2 \cdot (1.9335) - 5 = -1.133$$

$$x_4 = 1.9335 - \frac{0.071}{-1.133} = 1.9962$$

$$x_4 = 1.9962$$

$$f(x_4) = (1.9962)^2 - 5(1.9962) + 6$$

$$= 3.915 \times 10^{-3}, 3.676 \times 10^{-3}$$

$$f'(x_4) = 2 \times 1.9962 - 5 = -1.0078$$

$$x_5 = x_4 + \frac{f(x_4)}{f'(x_4)} = 1.9962 - \frac{3.676 \times 10^{-3}}{-1.0078}$$

$$= 1.999979, 1.99985$$

K	$x_K$	$f(x_K)$
0	1	2
1	1.667	0.444
2	1.9335	0.071
3	1.9962	<del><math>3.915 \times 10^{-3}</math></del> $3.676 \times 10^{-3}$