

a) $F(x) = x^2$

x	F(x)
1	1
2	4
3	9

$$X_p = \frac{X_a + X_b}{2} = \frac{2 + 3}{2} = \frac{5}{2} = 2.5$$

$$F(x_p) = (2.5)^2 = 6.25 \quad F(x_b) \quad F(x_a)$$

$$E = \left| \frac{2.5 - 2}{2.5} \right| = 0.2 = 20\%$$

b) $F(x) = x^3$

x	F(x)
2	8
3	27
4	64

$$X_p = \frac{X_a + X_b}{2} = \frac{3 + 4}{2} = \frac{7}{2} = 3.5$$

$$F(x_p) = (3.5)^3 = 42.875 \quad F(x_b) \quad F(x_a)$$

$$E = \left| \frac{3.5 - 3}{3} \right| = 0.14 = 14\%$$

c) $F(x) = x^2 + 2$

x	F(x)
1	3
2	6
4	18

$$X_p = \frac{X_a + X_b}{2} = \frac{2 + 4}{2} = 3$$

$$F(x_p) = (3)^2 + 2 = 11 \quad F(x_b) \quad F(x_a)$$

$$E = \left| \frac{3 - 2}{2} \right| = 0.5 = 50\%$$

d) $F(x) = x^2 - 2$ $X_p = \frac{X_a + X_b}{2} = \frac{3 + 4}{2} = \frac{7}{2} = 3.5$

x	F(x)
2	2
3	7
4	14

$$F(x_p) = (3.5)^2 - 2 = 10.25$$

$$E = \left| \frac{3.5 - 3}{3} \right| = 0.14 = 14\%$$

e) $F(x) = (x+2)^2$

x	F(x)
2	16
3	25
4	36

$$X_p = \frac{X_a + X_b}{2} = \frac{3 + 4}{2} = \frac{7}{2} = 3.5$$

$$F(x_p) = (3.5 + 2)^2 = 30.25$$

$$E = \left| \frac{3.5 - 3}{3} \right| = 0.14 = 14.28\%$$

f) $f(x) = (x+2)^3$ $x_p = \frac{x_a + x_b}{2} = \frac{2+4}{2} = \frac{6}{2} = 3$

x	f(x)
1	27
x_a 2	64
x_b 4	216

$f(x_p) = ((3+2))^3 = 125$

$E = \left| \frac{125-2}{3} \right| = 0.33 = 33.33\%$

g) $f(x) = x+2$ $x_p = \frac{x_a + x_b}{2} = \frac{4+5}{2} = \frac{9}{2} = 4.5$

x	f(x)
3	5
x_a 4	6
x_b 5	7

$f(x_p) = (4.5+2)^2 = 42.25$

$E = \left| \frac{42.25-4}{42.25} \right| = 0.90 = 90\%$

h) $f(x) = x-2$ $x_p = \frac{x_a + x_b}{2} = \frac{2+3}{2} = \frac{5}{2} = 2.5$

x	f(x)
1	-1
x_a 2	0
x_b 3	1

$f(x_p) = (2.5-2)^2 = 0.25$

$E = \left| \frac{0.25-2}{0.25} \right| = -7\%$

i) $f(x) = [4x^2 - 5x]$ $x_a = 1$, $x_b = 2$ error = 5%

Iteración 1

$x_p = \frac{x_a + x_b}{2} = \frac{1+2}{2} = \frac{3}{2} = 1.5$

$f(x_p) = (4(1.5)^2 - 5(1.5)) = 1.5$

Iteración 2

$x_p = \frac{x_{a1} + x_{b1}}{2} = \frac{1.5+2}{2} = 1.75$ $E = \left| \frac{1.75-1.5}{1.75} \right| = 0.14 = 14.28\%$

Iteración 3

$x_{p2} = \frac{x_{a2} + x_{b2}}{2} = \frac{1.77+2}{2} = 1.87$ $E = \left| \frac{1.87-1.75}{1.87} \right|$

$= 0.06 = 6\%$

Iteración 4

$$X_{p3} = \frac{X_{a3} + X_{b3}}{2} = \frac{1.87 + 2}{2} = 1.93$$

$$E = \left| \frac{1.93 - 1.89}{1.93} \right| = 0.03 = 3.10\%$$

j) $f(x) = (e^{2x} - 5x)$ $X_a = -2$ $X_b = 2$ $\text{error} = 5\%$

$$X_p = \frac{X_a + X_b}{2} = \frac{-2 + 2}{2} = \frac{0}{2} = 0$$

k) $f(x) = (\sin x - x + 10)$ $X_a = 9$ $X_b = 11$
 $\text{error} = 5\%$

$$X_p = \frac{X_a + X_b}{2} = \frac{9 + 11}{2} = 10$$

$$f(X_p) = (\sin(10) - 10 + 10) = 0.17$$

$$X_{a1} = \frac{X_p + X_b}{2} = \frac{10 + 11}{2} = 10.5$$

$$E = \left| \frac{10.5 - 10}{10.5} \right| = 0.047 = 4.76\%$$