Answer on Question #80314 – Math – Calculus

Question

Find the points of inflections of the curve y = x^4-4x^3-18x^2+1

Solution

To find the inflection point of a function, it is necessary to find a second-order derivative function and equate it to zero.

y" = (x^4-4x^3-18x^2+1)" = 12x^2 -24x – 36

12x^2 – 24x – 36 = 0

x^2 – 2x – 3 = 0 (a = 1, b = -2, c = -3)

D = b^2 – 4ac

x1 = (-b + (D)^0.5)/2a

x2 = (-b - (D)^0.5)/2a

D = 4 + 12 = 16

x1 = (2 + 4)/2 = 3

x2 = (2-4)/2 = -1

y1=y(3) = (3^4 – 4*(3)^3 – 18*(3)^2 + 1) = -188

y2=y(-1) = ((-1)^4 – 4*(-1)^3 – 18*(-1)^2 + 1) = -12

Thus, the points of inflection are (x1, y1) = (3, -188), (x2, y2) =(-1, -12).

Answer: (x1, y1) = (3, -188), (x2, y2) =(-1, -12).