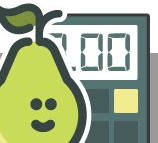
SWI Week 7

If $f(6) = 3$, $f'(6) = 1/2$ and $f''(6) = 2$, what could be the value of $f(7)$?



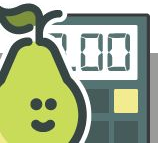
Students, enter a number!

$f(x, y) = xy^2$. Take $\eta = 1$ and $(x_0, y_0) = (2, 2)$. What will be the value of the function after two iterations as per Gradient descent?

Students, write your response!

$f(x, y) = 2xy + 2x - x^2 - 2y^2$. Take $\eta = 0.2$ and $(x_0, y_0) = (-1, -1)$. What will be the value of x_2 as per Gradient descent?

At what value of x will $f(x) = (2x - 8)^2$ be minimum?



Students, enter a number!

Assuming $x_0 = 2$ and $\eta = 0.05$ What is the number of iterations required to reach x, in the previous question using the method of Gradient descent? (Consider an error of 0.1)

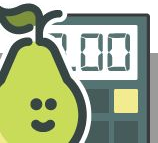
We can also use Newton's method for such optimization. The update rule for Newton's method is given by:

$$x_{n+1} = x_n - \frac{f'(x_n)}{f''(x_n)}$$

Find the number of iterations required to reach x obtained in Q1 (Consider an error of 0.1).

Consider the function $f(x) = x^3 - x^2 - x + 5$,
At which positive value of x is $f(x)$ minimum?

Assuming initial guess $x_0 = 0.75$ and Step size, $\eta = 0.25$, What is the number of iterations required to reach x, in the previous question using the method of Gradient descent? (Consider an error of 0.001)



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$$x_{n+1} = x_n - \frac{f'(x_n)}{f''(x_n)}$$

Find the number of iterations required to reach x obtained in Q1 (Consider an error of 0.001).