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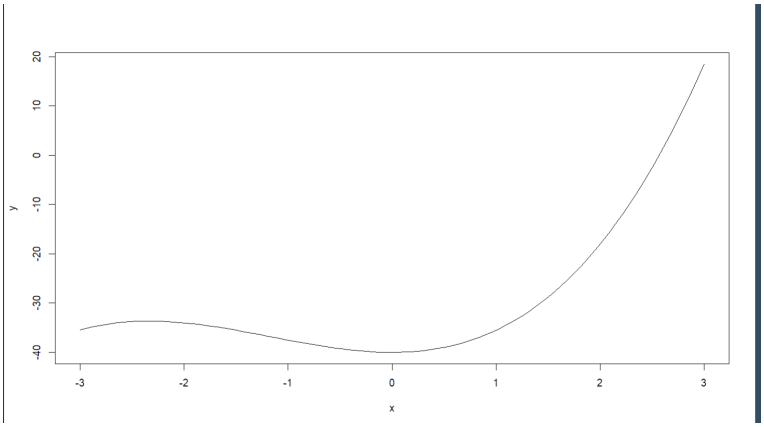
WORD PROBLEM

Graph



Guess: -3, 0, 3

FINAL ITERATION (5)						
x0	x1	x2	f(x0)	f(x1)	f(x2)	Error
2.2561	2.568	2.568	-0.2582	-0.0006989	3.001e-08	3.096e-08

By utilizing Muller's Method, initial guesses of **-3,0, and 3** were applied to the function A(x) = x^3 + 3.5x^2 - 40. After 5 iterations, the concentration of hydrochloric ions was determined to be **2.568 (denoted as x3)**. This concentration resulted in a saturated solution of magnesium hydroxide in a hydrochloric acid solution, achieving an acidity level of zero.

```
> MullerMethod (f, x0, x1, x2, macheps, max, verbose);
  x0    x1    x2    f(x0)   f(x1)      f(x2)      A     B     C         x3    f(x3)      Error
1 -3    0     3     -35.5   -40        18.5       3.5   30    18.5      2.331 -8.312     28.69
2 0     3     2.331 -40     18.5       -8.312     8.831 34.18 -8.312    2.561 -0.2582    8.965
3 3     2.331 2.561 18.5    -8.312     -0.2582    11.39 37.7  -0.2582   2.568 -0.0006989 0.2663
4 2.331 2.561 2.568 -8.312  -0.2582    -0.0006989 10.96 37.75 -0.0006989 2.568 3.001e-08  0.0007211
5 2.561 2.568 2.568 -0.2582 -0.0006989 3.001e-08  11.2  37.75 3.001e-08  2.568 0          3.096e-08

$f
function (x) (x ^ 3) + (3.5 * (x ^ 2)) - 40
<bytecode: 0x000001e614d67298>

$Given_x0
[1] -3

$Given_x1
[1] 0

$Given_x2
[1] 3

$x3
[1] 2.568

$iterations
[1] 5

$ea
[1] 3.096e-08
```