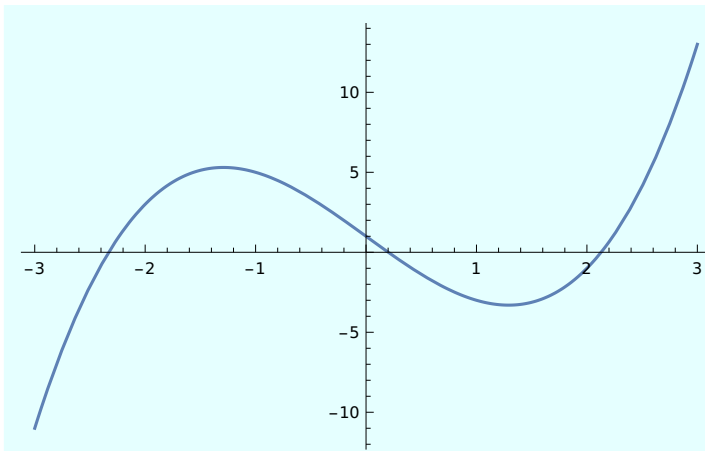


■ NEWTON RAPSON

```
In[ ]:= f[x_] := x^3 - 5 x + 1
Plot[f[x], {x, -3, 3}]
```

Out[]:=



```
In[ ]:= f[x_] := x^3 - 5 x + 1
a[0] = -2.5;
Do[a[n + 1] = a[n] - (f[a[n]] / f'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]
```

Out[]//TableForm=

0	-2.5	-2.125
1	-2.34545	-0.175441
2	-2.3302	-0.00163309
3	-2.33006	-1.46276×10^{-7}
4	-2.33006	-1.77636×10^{-15}
5	-2.33006	-1.77636×10^{-15}
6	-2.33006	-1.77636×10^{-15}
7	-2.33006	-1.77636×10^{-15}
8	-2.33006	-1.77636×10^{-15}
9	-2.33006	-1.77636×10^{-15}

```

In[ ]:= f[x_] := x^3 - 5 x + 1
a[0] = 2.5;
Do[a[n + 1] = a[n] - (f[a[n]] / f'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]

```

Out[]//TableForm=

0	2.5	4.125
1	2.2	0.648
2	2.13193	0.0302634
3	2.12843	0.0000785102
4	2.12842	5.33314×10^{-10}
5	2.12842	-1.77636×10^{-15}
6	2.12842	-1.77636×10^{-15}
7	2.12842	-1.77636×10^{-15}
8	2.12842	-1.77636×10^{-15}
9	2.12842	-1.77636×10^{-15}

```

In[ ]:= f[x_] := x^3 - 5 x + 1
a[0] = 0.5;
Do[a[n + 1] = a[n] - (f[a[n]] / f'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]

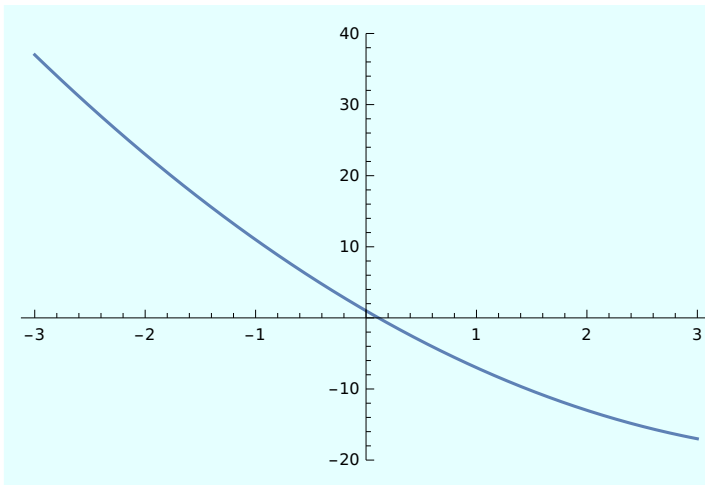
```

Out[]//TableForm=

0	0.5	-1.375
1	0.176471	0.123143
2	0.201568	0.000349276
3	0.20164	3.10048×10^{-9}
4	0.20164	1.11022×10^{-16}
5	0.20164	1.11022×10^{-16}
6	0.20164	-2.22045×10^{-16}
7	0.20164	1.11022×10^{-16}
8	0.20164	1.11022×10^{-16}
9	0.20164	-2.22045×10^{-16}

```
In[ ]:= g[x_] := x^2 - 9 x + 1
Plot[g[x], {x, -3, 3}]
```

Out[]:=



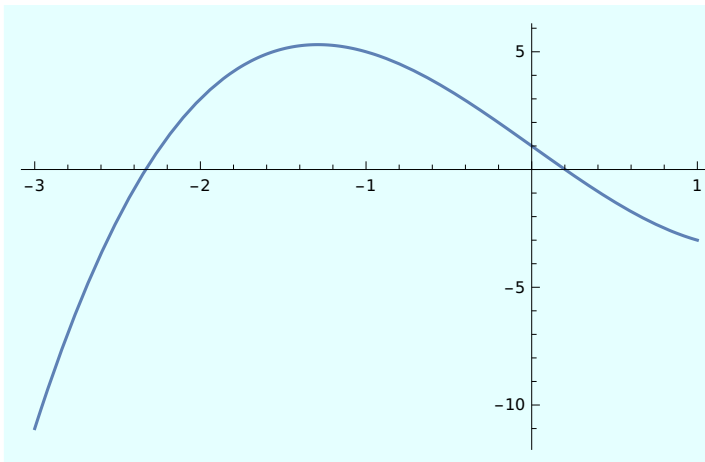
```
In[ ]:= g[x_] := x^2 - 9 x + 1
a[0] = 0.5;
Do[a[n + 1] = a[n] - (g[a[n]] / g'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], g[a[n]]}, {n, 0, 9}]]
```

Out[]//TableForm=

0	0.5	-3.25
1	0.09375	0.165039
2	0.112478	0.000350732
3	0.112518	1.59754×10^{-9}
4	0.112518	0.
5	0.112518	0.
6	0.112518	0.
7	0.112518	0.
8	0.112518	0.
9	0.112518	0.

```
In[ ]:= h[x_] := x^3 - 2 x + 5
Plot[f[x], {x, -3, 1}]
```

Out[]:=



```
In[ ]:= h[x_] := x^3 - 2 x + 5
a[0] = -2.5;
Do[a[n + 1] = a[n] - (h[a[n]] / h'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], h[a[n]]}, {n, 0, 9}]]
```

Out[]//TableForm=

0	-2.5	-5.625
1	-2.16418	-0.807945
2	-2.09714	-0.0288817
3	-2.09456	-0.0000418649
4	-2.09455	-8.84022×10^{-11}
5	-2.09455	8.88178×10^{-16}
6	-2.09455	8.88178×10^{-16}
7	-2.09455	8.88178×10^{-16}
8	-2.09455	8.88178×10^{-16}
9	-2.09455	8.88178×10^{-16}

```

In[ ]:= h[x_] := x^3 - 2 x + 5
a[0] = 0.5;
Do[a[n + 1] = a[n] - (h[a[n]] / h'[a[n]]), {n, 0, 9}]
TableForm[Table[{n, a[n], h[a[n]]}, {n, 0, 9}]]

```

Out[]//TableForm=

0	0.5	4.125
1	3.8	52.272
2	2.53495	16.2196
3	1.5962	5.87448
4	0.55528	4.06065
5	4.33266	77.6671
6	2.90274	23.6528
7	1.88663	7.94197
8	0.971461	3.97388
9	-3.80937	-42.6602

Power: Infinite expression $\frac{1}{0}$ encountered.

Infinity: Indeterminate expression 0 ComplexInfinity encountered.