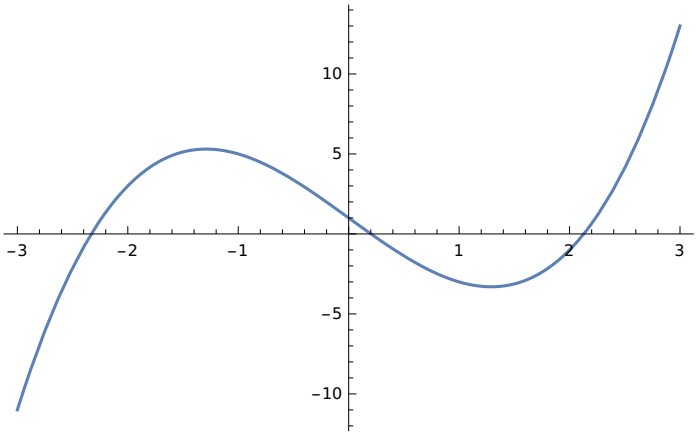
■ SECANT METHOD

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

Out[2]=



■ Applying Secant Method Formula

In[12]:=
```
f[x_] := x^3 - 5 x + 1
a[0] = 2.0;
a[1] = 3.0;
Do[
  a[n + 2] = a[n + 1] - ((a[n + 1] - a[n])/(f[a[n + 1]] - f[a[n]])) f[a[n + 1]], {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]
```

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

Infinity : Indeterminate expression 0. ComplexInfinity encountered.

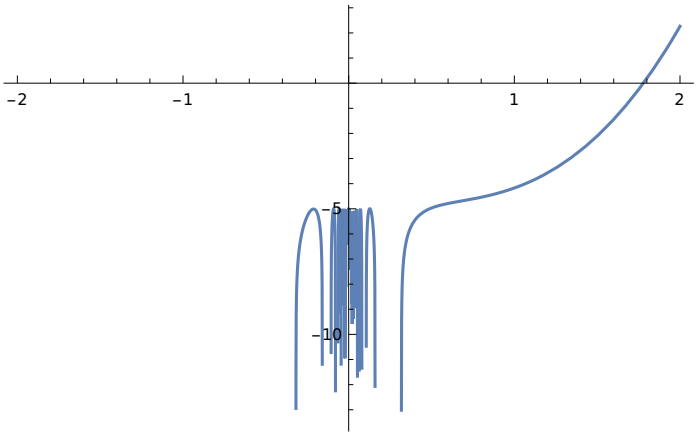
Out[16]//TableForm=

0	2.	-1.
1	3.	13.
2	2.07143	-0.469023
3	2.10376	-0.207936
4	2.12952	0.00943116
5	2.1284	-0.000175111
6	2.12842	-1.42692×10^{-7}
7	2.12842	2.16183×10^{-12}
8	2.12842	-1.77636×10^{-15}
9	2.12842	-1.77636×10^{-15}

■ Question 2

In[17]:=
```
f[x_] := Log[Sin[1 / x]] + x^3 - 5
Plot[f[x], {x, -2, 2}]
```

Out[18]=



In[27]:=
```
a[0] = 1.0;
a[1] = 2.0;
Do[
  a[n + 2] = a[n + 1] - ((a[n + 1] - a[n]) / (f[a[n + 1]] - f[a[n]])) f[a[n + 1]], {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]
```

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

Infinity: Indeterminate expression 0. ComplexInfinity encountered.

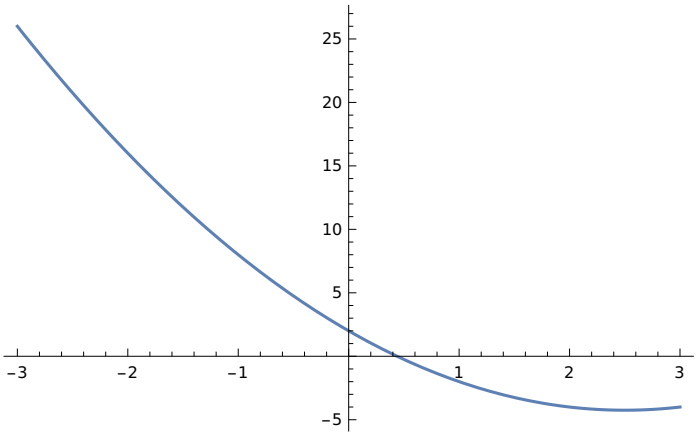
Out[30]//TableForm=

0	1.	-4.1726
1	2.	2.26483
2	1.64818	-1.08454
3	1.7621	-0.149467
4	1.78031	0.0127513
5	1.77888	-0.000130358
6	1.77889	-1.1174×10^{-7}
7	1.77889	9.79661×10^{-13}
8	1.77889	0.
9	1.77889	0.

■ Question 3

In[31]:=
```
f[x_] := x^2 - 5 x + 2
Plot[f[x], {x, -3, 3}]
```

Out[32]=



In[33]:=
```
a[0] = 0.0;
a[1] = 1.0;
Do[
  a[n + 2] = a[n + 1] - ((a[n + 1] - a[n])/(f[a[n + 1]] - f[a[n]])) f[a[n + 1]], {n, 0, 9}]
TableForm[Table[{n, a[n], f[a[n]]}, {n, 0, 9}]]
```

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

Infinity: Indeterminate expression 0. ComplexInfinity encountered.

Out[36]//TableForm=

0	0.	2.
1	1.	-2.
2	0.5	-0.25
3	0.428571	0.0408163
4	0.438596	-0.000615574
5	0.438448	-1.47102×10^{-6}
6	0.438447	5.32698×10^{-11}
7	0.438447	0.
8	0.438447	0.
9	Indeterminate	Indeterminate