

ANULARE - Ecuatia de gradul al doilea

Fie ecuatia $x^2 - 10^8x + 1 = 0$. Aceasta ecuatie pune probleme. Anularea poate apare daca $b^2 \gg 4ac$.

Pentru rezolvare vom folosi formula $x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

```
format long
a=1; c=1; b=-100000000; %b=-1e8
% Calculam radacinile obisnuit
x1=(-b+sqrt(b^2-4*a*c))/(2*a)
```

```
x1 =      100000000
```

```
x2=(-b-sqrt(b^2-4*a*c))/(2*a)
```

```
x2 =      7.450580596923828e-09
```

Apare anulare la calculul lui x_2 . **Remediu:** amplificam cu conjugata

$$x_2 = \frac{2c}{-b + \sqrt{b^2 - 4ac}}$$

```
x1=(-b+sqrt(b^2-4*a*c))/(2*a)
```

```
x1 =      100000000
```

```
x2a=2*c/(-b+sqrt(b^2-4*a*c))
```

```
x2a =      1.0000000000000000e-08
```

Acelasi rezultat se obtine cu `roots`

```
x=roots([a,b,c]);
x(1),x(2)
```

```
ans =      9.999999999999999e+07
```

```
ans =      1.0000000000000000e-08
```

Altfel, folosim relatiile lui Viete, $x_1x_2 = \frac{c}{a} \Rightarrow x_2 = \frac{c}{x_1}$

```
d = sqrt(b^2 - 4*a*c);
```

```
x1 = (-b - sign(b)*d) / (2*a)
```

```
x1 = 100000000
```

```
x2 = c/a/x1
```

```
x2 = 1.0000000000000000e-08
```