

```

function x = wortel(a,b,c)
% note that the case a==0 is not included in the below code...(could/should be
  added as well)!
% add a check for the case b=0 as well.
format long

% calculate discriminant:
D=b^2-4*a*c;

% If D<0, then both solutions are complex.
if D<0
    disp('Complex solutions')
% If D=0, then there is one solution.
elseif D==0
    x=-0.5*b/a;
    disp('The smallest solution in absolute value is:')
% If D>0, then there are two real solutions.
else
    x1=(-b+sqrt(D))/(2*a);
    x2=(-b-sqrt(D))/(2*a);
    if abs(x1)>abs(x2)
        disp('The smallest solution in absolute value is:')
        x=x1
    else
        disp('The smallest solution in absolute value is:')
        x=x2
    end
end
end

```

wortel.m

Exercise 1a

FLOW DIAGRAM

("stroomdiagram")

file:
wortel.m

$$ax^2+bx+c=0$$

start

input a, b, c values

"IF" is a = 0?

calculate $D = b^2 - 4ac$

"IF" is D < 0?

text: "complex solutions"

(A+Bi
i2 Matlab)

"IF" is b = 0?

$x = -c/b$

text: "nosolution"

"C=0 ?!"

calculate $\begin{cases} x_1 = \frac{-b + \sqrt{D}}{2a} \\ x_2 = \frac{-b - \sqrt{D}}{2a} \end{cases}$

calculate $|x_1|, |x_2|$

"IF" is $|x_1| < |x_2|$?

$x = x_1$

$x = x_2$

```

% adjust time points... t = 0, 1, 2, 3, 4...
% create a picture of a hurricane:
t=4.0;
ee=0.01;
xx=-4:0.1:4;
yy=xx;
% check why meshgrid is needed...:
[x,y]=meshgrid(xx,yy);

% check why the dots are needed in all the formulas:
r=sqrt(x.^2+y.^2+ee);
vt=tanh(r)./(cosh(r).*cosh(r));
vtm=0.385;
omega=vt./(r.*vtm);
arg=0.5*y.*cos(omega*t)-0.5*x.*sin(omega*t);

T=-tanh(arg);
% what is the difference between surf and mesh?
surf(x,y,T)
%add: view, shading flat, print -depsc, title, xlabel, ylabel
% for example:
%view(10,30)
%shading flat

```

Katrina.m

Exercise 1b