PSET_1

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How to apply the quadratic equation

This lesson demonstrates how to apply the quadratic equation with an example. We will also graphically demonstrate the solution.

Applying quadratic equation

The roots of a quadratic equation of the form $f(x) = ax^2 + bx + d = 0$ are:

$$x = \frac{-b \pm \sqrt{b^2 - 4ad}}{2a}$$

In this example, we will only report the real roots.

```
# Define the variables
a <- 1
b <- 3
d <- 2

# Calculating the roots
a <- as.complex(a)
roots <- c( ((-b + sqrt(b^2 - 4*a*d)) / (2*a)),
             ((-b - sqrt(b^2 - 4*a*d)) / (2*a)) )
if(all(Im(roots) == 0)){
  roots <- Re(roots)
  print(roots)
}
```

```
[1] -1 -2
```

Graphical solution of quadratic equation

The x-intercepts of the graph give the roots of the quadratic equation if the roots are real. Here, they are marked in red.