

A very simple latex document

# Quadratic equation

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## 1 Problem

Given three real numbers  $a, b, c$ , solve the equation:

$$ax^2 + bx + c = 0. \tag{1}$$

## 2 Solution

We consider two cases:

1.  $a = 0$ .

- If  $b = 0, c = 0 \Rightarrow$  solution is  $x \in R$
- If  $b = 0, c \neq 0 \Rightarrow$  there no  $x$  satisfying equation (1).
- If  $b \neq 0 \Rightarrow x = -\frac{c}{b}$

2.  $a \neq 0$ . Let  $\Delta = b^2 - 4ac$ .

$$x = \begin{cases} \frac{-b \pm \sqrt{\Delta}}{2a} & \text{if } \Delta > 0. \\ \frac{-b}{2a} & \text{if } \Delta = 0 \\ 0 & \text{other wise} \end{cases} \tag{2}$$

## 3 Example

Find  $x$ -intercepts of the graph  $y = x^2 - x - 2$ .

1. Using graph shown in Figure 1.

The solution is  $x \in \{1, 2\}$

2. Using (2). We need to solve the following quadratic equation:

$$x^2 - x - 2 = 0. \tag{3}$$

$\Rightarrow$  solution  $x \in \{-1, 2\}$ .

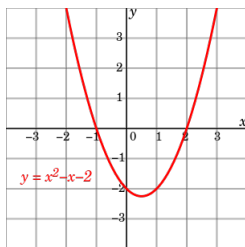


Figure 1: Caption is here

## 4 More examples

Given  $a, b, c$ , find  $x$ :

Table 1: My caption

$a$	$b$	$c$	$x_1$	$x_2$
1	-4	3	1	3
1	-2	1	1	1

## 5 Citations

[1] [1, 2]

## References

- [1] T. H. Vu, H. S. Mousavi, V. Monga, U. A. Rao, and G. Rao, “Dfdl: Discriminative feature-oriented dictionary learning for histopathological image classification,” in *2015 IEEE 12th International Symposium on Biomedical Imaging (ISBI)*. IEEE, 2015, pp. 990–994.
- [2] T. H. Vu, H. S. Mousavi, V. Monga, G. Rao, and U. A. Rao, “Histopathological image classification using discriminative feature-oriented dictionary learning,” *IEEE transactions on medical imaging*, vol. 35, no. 3, pp. 738–751, 2016.