A very simple latex doccument

Quadratic equation

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1 Problem

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

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

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 $b \neq 0 \Rightarrow x = -\dfrac{c}{b}$
2. $a \neq 0$. Let $\Delta = b^2 - 4ac$.

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

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

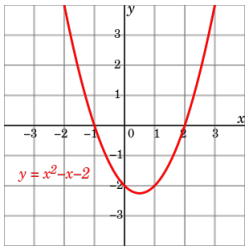

Figure 1: Caption is here

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.