이차방정식의 근의 공식에서의 판별

(Discriminant of the Quadratic Formula)

Start End

Start End

$$ax^2 + bx + c = 0 \ \ (a \neq 0)$$

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- $a, b, c \in \mathbb{R}$

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- $a, b, c \in \mathbb{R}$
  - $b^2 - 4ac > 0$

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  - $b^2 - 4ac > 0$: Two distinct real roots

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Start End

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- $a, b, c \in \mathbb{C}$

Start End

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  - $b^2 - 4ac = 0$: Two coincident real roots
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- $a, b, c \in \mathbb{C}$
  - $b^2 - 4ac \neq 0$

Start End

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  - $b^2 - 4ac < 0$: Two distinct complex roots which are not real
- $a, b, c \in \mathbb{C}$
  - $b^2 - 4ac \neq 0$: Two distinct roots
  - $b^2 - 4ac = 0$: Two coincident roots

Home Start End

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

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$$
\begin{aligned}
ax^2 + bx + c &= 0 \\
a\left(x^2 + \frac{b}{a}x\right) + c &= 0
\end{aligned}
$$

Home Start End

$$
\begin{aligned}
ax^2 + bx + c &= 0 \\
a\left(x^2 + \frac{b}{a}x\right) + c &= 0 \\
a\left(x^2 + 2\frac{b}{2a}x + \frac{b^2}{4a^2} - \frac{b^2}{4a^2}\right) + c &= 0
\end{aligned}
$$

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ax^2 + bx + c &= 0 \\
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a\left(x^2 + 2\frac{b}{2a}x + \frac{b^2}{4a^2} - \frac{b^2}{4a^2}\right) + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2}{4a} + c &= 0
\end{aligned}
$$

Home Start End

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\begin{aligned}
ax^2 + bx + c &= 0 \\
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a\left(x^2 + 2\frac{b}{2a}x + \frac{b^2}{4a^2} - \frac{b^2}{4a^2}\right) + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2}{4a} + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2}{4a} - c
\end{aligned}
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$$
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a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2}{4a} + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2}{4a} - c \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2 - 4ac}{4a}
\end{aligned}
$$

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ax^2 + bx + c &= 0 \\
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a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2}{4a} - c \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2 - 4ac}{4a} \\
\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2 - 4ac}{4a^2}
\end{aligned}$$

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$$
\begin{aligned}
ax^2 + bx + c &= 0 \\
a\left(x^2 + \frac{b}{a}x\right) + c &= 0 \\
a\left(x^2 + 2\frac{b}{2a}x + \frac{b^2}{4a^2} - \frac{b^2}{4a^2}\right) + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2}{4a} + c &= 0 \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2}{4a} - c \\
a\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2 - 4ac}{4a} \\
\left(x + \frac{b}{2a}\right)^2 &= \frac{b^2 - 4ac}{4a^2} \quad (\because a \neq 0)
\end{aligned}
$$

Home Start End

$$\begin{aligned} ax^2+bx+c &= 0\\ a\left(x^2+\frac{b}{a}x\right)+c &= 0\\ a\left(x^2+2\frac{b}{2a}x+\frac{b^2}{4a^2}-\frac{b^2}{4a^2}\right)+c &= 0\\ a\left(x+\frac{b}{2a}\right)^2-\frac{b^2}{4a}+c &= 0\\ a\left(x+\frac{b}{2a}\right)^2 &= \frac{b^2}{4a}-c\\ a\left(x+\frac{b}{2a}\right)^2 &= \frac{b^2-4ac}{4a}\\ \left(x+\frac{b}{2a}\right)^2 &= \frac{b^2-4ac}{4a^2}\ (\because a\neq 0) \end{aligned}$$

Github:
https://min7014.github.io/math20210203001.html

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