

실수의 절댓값

(The Absolute Value of Real Numbers)

▶ Start

$$a \in \mathbb{R},$$

▶ Start

$$a \in \mathbb{R}, |a|$$

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$$a \in \mathbb{R}, |a| = \left\{ \right.$$

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a \end{cases}$$

▶ Start

$$a \in \mathbb{R}, |a| = \begin{cases} a, & \text{if } a \geq 0 \end{cases}$$

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a & , \quad \text{if } a \geq 0 \\ -a & \end{cases}$$

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a & , \quad \text{if } a \geq 0 \\ -a & , \quad \text{if } a < 0 \end{cases}$$

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a & , \quad \text{if } a \geq 0 \\ -a & , \quad \text{if } a < 0 \end{cases}$$

- $|a| = |-a|$ ▶ Proof

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a & , \quad \text{if } a \geq 0 \\ -a & , \quad \text{if } a < 0 \end{cases}$$

- $|a| = |-a|$ ▶ Proof
- $|a|^2 = a^2, |a| = \sqrt{a^2}$ ▶ Proof

▶ Start

$$a \in \mathbb{R}, \quad |a| = \begin{cases} a & , \quad \text{if } a \geq 0 \\ -a & , \quad \text{if } a < 0 \end{cases}$$

- $|a| = |-a|$ ▶ Proof
- $|a|^2 = a^2, |a| = \sqrt{a^2}$ ▶ Proof
- $|ab| = |a||b|$ ▶ Proof

▶ Start

$$a \in \mathbb{R}, |a| = \begin{cases} a & , \text{ if } a \geq 0 \\ -a & , \text{ if } a < 0 \end{cases}$$

- $|a| = |-a|$ ▶ Proof
- $|a|^2 = a^2, |a| = \sqrt{a^2}$ ▶ Proof
- $|ab| = |a||b|$ ▶ Proof
- $\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$ ▶ Proof

▶ Start

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$$|a| = |-a|$$

▶ Start ▶ end

$$|a| = |-a|$$

i) $a > 0$

▶ Start ▶ end

$$|a| = |-a|$$

i) $a > 0$

$$|a|$$

▶ Start

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$$|a| = |-a|$$

i) $a > 0$

$$|a| = a$$

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$$|a| = |-a|$$

i) $a > 0$

$$|a| = a = -(-a)$$

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$$|a| = |-a|$$

i) $a > 0$

$$|a| = a = -(-a) = |-a|$$

▶ Start

▶ end

$$|a| = |-a|$$

i) $a > 0$

$$|a| = a = -(-a) = |-a|$$

ii) $a = 0$

▶ Start

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$$|a| = |-a|$$

i) $a > 0$

$$|a| = a = -(-a) = |-a|$$

ii) $a = 0$

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$$|a| = |-a|$$

i) $a > 0$

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ii) $a = 0$

$$|a| = |0|$$

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ii) $a = 0$

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iii) $a < 0$

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$$|a| = |-a|$$

i) $a > 0$

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$$|a| = |0| = |-0| = |-a|$$

iii) $a < 0$

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i) $a > 0$

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$$|a| = -a$$

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$$|a| = |-a|$$

i) $a > 0$

$$|a| = a = -(-a) = |-a|$$

ii) $a = 0$

$$|a| = |0| = |-0| = |-a|$$

iii) $a < 0$

$$|a| = -a = |-a|$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

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$$|a|^2$$

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ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

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i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

iii) $a < 0$

$$|a|^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

iii) $a < 0$

$$|a|^2 = (|a|)^2$$

▶ Start

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

iii) $a < 0$

$$|a|^2 = (|a|)^2 = (-a)^2$$

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$$|a|^2 = a^2, |a| = \sqrt{a^2}$$

i) $a > 0$

$$|a|^2 = (|a|)^2 = (a)^2 = a^2$$

ii) $a = 0$

$$|a|^2 = |0|^2 = 0 = 0^2 = a^2$$

iii) $a < 0$

$$|a|^2 = (|a|)^2 = (-a)^2 = a^2$$

▶ Start ▶ end

$$|ab| = |a||b|$$

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$$|ab| = |a||b|$$

$$(|ab|)^2$$

▶ Start

▶ end

$$|ab| = |a||b|$$

$$(|ab|)^2 = (ab)^2$$

▶ Start

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$$|ab| = |a||b|$$

$$(|ab|)^2 = (ab)^2 = a^2b^2$$

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$$|ab| = |a||b|$$

$$(|ab|)^2 = (ab)^2 = a^2b^2 = (|a|)^2 (|b|)^2$$

▶ Start

▶ end

$$|ab| = |a||b|$$

$$(|ab|)^2 = (ab)^2 = a^2b^2 = (|a|)^2 (|b|)^2 = (|a||b|)^2$$

▶ Start

▶ end

$$|ab| = |a||b|$$

$$(|ab|)^2 = (ab)^2 = a^2b^2 = (|a|)^2 (|b|)^2 = (|a||b|)^2$$

$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

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$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

$$\left(\left| \frac{a}{b} \right| \right)^2$$

▶ Start

▶ end

$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

$$\left(\left| \frac{a}{b} \right| \right)^2 = \left(\frac{a}{b} \right)^2$$

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$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

$$\left(\left| \frac{a}{b} \right| \right)^2 = \left(\frac{a}{b} \right)^2 = \frac{a^2}{b^2}$$

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$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

$$\left(\left| \frac{a}{b} \right| \right)^2 = \left(\frac{a}{b} \right)^2 = \frac{a^2}{b^2} = \frac{|a|^2}{|b|^2}$$

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$$\left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0)$$

$$\left(\left| \frac{a}{b} \right| \right)^2 = \left(\frac{a}{b} \right)^2 = \frac{a^2}{b^2} = \frac{|a|^2}{|b|^2} = \left(\frac{|a|}{|b|} \right)^2$$

Github:

<https://min7014.github.io/math20201222001.html>

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and you can see a picture moving.