Pensieve Header: Experiments with "Assuming".

Re[x + I y]

$-\text{Im}[y] + \text{Re}[x]$

Simplify[Re[(5 + 4 I) (x + I y)], x ∈ Reals && y ∈ Reals]

$\text{Re}[(5 + 4 \, \mathbb{i}) \, (x + \mathbb{i} \, y)]$

Expand[(5 + 4 I) (x + I y)]

$(5 + 4 \, \mathbb{i}) \, x - (4 - 5 \, \mathbb{i}) \, y$

Simplify[Re[Expand[(5 + 4 I) (x + I y)]], x ∈ Reals && y ∈ Reals]

$\text{Re}[(5 + 4 \, \mathbb{i}) \, (x + \mathbb{i} \, y)]$

Simplify[Re[x + I y], x ∈ Reals && y ∈ Reals]

x

Simplify$\left[$Re$\left[(x + I y)^3\right]$, x ∈ Reals && y ∈ Reals$\right]$

$\text{Re}\left[(x + \mathbb{i} \, y)^3\right]$

Refine$\left[$Re$\left[(x + I y)^3\right]$, x ∈ Reals && y ∈ Reals$\right]$

$\text{Re}\left[(x + \mathbb{i} \, y)^3\right]$

Simplify$\left[$Re$\left[\dfrac{1}{x + I y}\right]$, x ∈ Reals && y ∈ Reals$\right]$

$\text{Re}\left[\dfrac{1}{x + \mathbb{i} \, y}\right]$

Refine$\left[$Re$\left[\dfrac{1}{x + I y}\right]$, x ∈ Reals && y ∈ Reals$\right]$

$\text{Re}\left[\dfrac{1}{x + \mathbb{i} \, y}\right]$

ComplexExpand$\left[\dfrac{1}{x + I y}\right]$

$\dfrac{x}{x^2 + y^2} - \dfrac{\mathbb{i} \, y}{x^2 + y^2}$

ComplexExpand$\left[$Re$\left[\dfrac{1}{x + I y}\right]\right]$

$\dfrac{x}{x^2 + y^2}$

$$\text{Re}\left[\text{ComplexExpand}\left[\frac{1}{x + I\, y}\right]\right]$$

$$\text{Im}\left[\frac{y}{x^2 + y^2}\right] + \text{Re}\left[\frac{x}{x^2 + y^2}\right]$$

$$\text{ComplexExpand}[\text{Im}[1\,/\,(x + I\, y)]]$$

$$-\frac{y}{x^2 + y^2}$$

$$\text{ComplexExpand}[\text{Re}[(5 + 4\, I)\, a]]$$

5 a

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