

[> restart

## Testataufgabe SW 1 Rohrer Felix

A: 101

$$\begin{aligned} > \text{simplify}\left(\frac{(x^2 + 2 \cdot x \cdot y + y^2)}{x^2 - y^2}\right) \\ & \frac{y + x}{x - y} \end{aligned} \quad (1)$$

A: 102

$$\begin{aligned} > \text{simplify}\left(\frac{1}{x^2 - 1}\right) \cdot \left(\frac{(x + 1)}{x + 2}\right) \\ & \frac{x + 1}{(x^2 - 1)(x + 2)} \end{aligned} \quad (2)$$

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A: 103

$$\begin{aligned} > \text{factor}(a^3 + 3 \cdot a^2 \cdot b + 3 \cdot a \cdot b^2 + b^3) \\ & (a + b)^3 \end{aligned} \quad (3)$$

$$\begin{aligned} > \text{factor}(x^6 + x^4 - x^2 - 1) \\ & (x - 1)(x + 1)(x^2 + 1)^2 \end{aligned} \quad (4)$$

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A: 104

$$\begin{aligned} > \text{restart} \\ > \text{Digits} := 3 \\ & \text{Digits} := 3 \end{aligned} \quad (5)$$

$$\begin{aligned} > \text{factor}(x^4 - 7 \cdot x + 5, \text{complex}) \\ & (x + 1.16 + 1.69 I)(x + 1.16 - 1.69 I)(x - 0.763)(x - 1.56) \end{aligned} \quad (6)$$

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A: 105

$$\begin{aligned} > \text{expand}((x^2 + x + 1) \cdot (x^3 - x^2 + 1)) \\ & x^5 + x + 1 \end{aligned} \quad (7)$$

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A: 106

$$\begin{aligned} > \text{simplify}\left(\frac{1}{x + 1} + \frac{1}{x + 2}\right) \\ & \frac{2x + 3}{(x + 1)(x + 2)} \end{aligned} \quad (8)$$

$$\begin{aligned} > \text{simplify}\left(\frac{1}{x - 1} + \frac{1}{x + 1}\right) \\ & \end{aligned} \quad (9)$$

$$\frac{2x}{x^2 - 1} \quad (9)$$

A: 107

> assume(x > 0)

> ln(exp(x))

$$x \sim$$

(10)

> exp(ln(x))

$$x \sim$$

(11)

A: 108

> restart

$$\text{simplify}\left(\frac{\left(\sin\left(\frac{\text{Pi}}{4}\right)\right)}{(1 + \text{sqrt}(2)) \cdot (1 - \text{sqrt}(2)) \cdot \text{sqrt}(3)}\right)$$

$$-\frac{1}{6} \sqrt{2} \sqrt{3}$$

(12)

A: 109

$$\sum_{k=1}^n k = \frac{1}{2} \cdot n \cdot (n + 1)$$

$$\frac{1}{2} (n + 1)^2 - \frac{1}{2} n - \frac{1}{2} = \frac{1}{2} n (n + 1)$$

(13)

A: 110

$$\sum_{i=1}^n i^2 = \frac{1}{6} \cdot n \cdot (n + 1) \cdot (2n + 1)$$

$$\frac{1}{3} (n + 1)^3 - \frac{1}{2} (n + 1)^2 + \frac{1}{6} n + \frac{1}{6} = \frac{1}{6} n (n + 1) (2n + 1)$$

(14)

A: 111

> restart

> assume(x > 0)

> a := sqrt(x·x) + 3

$$a := x \sim + 3$$

(15)

> simplify(a)

$$x \sim + 3$$

(16)

A: 112

> restart

> assume(k, integer)

> sin(k·Pi)

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$$\left. \begin{array}{l} | \\ \hline > \cos(k \cdot \text{Pi}) \\ \hline > \end{array} \right\} \begin{array}{l} 0 \\ (-1)^{k-1} \end{array} \quad \begin{array}{l} (17) \\ (18) \end{array}$$