

EXERCÍCIO 42 BEIMTA:

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$$\int \frac{dx}{x^2 - 4x + 9} =$$

! arco tangente!

$$x^2 - 4x + 9 = (x-2)^2 + 5$$

$x^2 - 4x + 4 + 5 = x^2 - 4x + 9$

$$\int \frac{f'(x)}{1+[f(x)]^2} dx = \arctan f(x)$$

$$\int \frac{dx}{x^2 - 4x + 9} = \int \frac{dx}{5 + (x-2)^2} = \frac{1}{5} \int \frac{dx}{1 + \frac{(x-2)^2}{5}} =$$

$$= \frac{1}{5} \int \frac{dx}{1 + \left(\frac{x-2}{\sqrt{5}}\right)^2} = \frac{1}{5} \sqrt{5} \int \frac{\frac{1}{\sqrt{5}} dx}{1 + \left(\frac{x-2}{\sqrt{5}}\right)^2} =$$

$$= \frac{\sqrt{5}}{5} \arctan \frac{x-2}{\sqrt{5}} = \frac{\sqrt{5}}{5} \cdot \arctan \frac{\sqrt{5}(x-2)}{5} + C$$