

5. Write the \LaTeX code of these math formulas! (4 point)

a) $\int \cos(2x) dx = \frac{1}{2} \sin(2x) + c$

b) $(a + b\sqrt{-1}) \cdot (a - b\sqrt{-1}) = a^2 + b^2$

c) $\prod_{i=1}^n p_i^{\beta_i+1}$

d) $\frac{\left(\frac{1+\sqrt{5}}{2}\right)^n - \left(\frac{1-\sqrt{5}}{2}\right)^n}{\sqrt{5}}$

6. Write the following system of equations with the use of `align*` (2 point)

$$\begin{aligned} 3x - 7y + z &= 0 \\ x + y - z &= -1 \end{aligned}$$

7. Write the following theorem (and its proof) in \LaTeX and use reference in it (frame not included): (2 point)

Lemma 1. *Every integer can be decomposed into product of primes and the decomposition is unique.*

Proof. Euclid or Gauss. \square

Lemma 1. is called the fundamental theorem of arithmetics.

8. Answer the \LaTeX questions! (2 point)

a) How to write the author in an article?

b) What is the origin of the name \LaTeX ?