$\LaTeX$ TEMPLATE

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Contents

1. Introduction

For $j : \mathbb{C} \longrightarrow \mathbb{CP}^1$, compute $j_* \underline{\mathbb{Q}}_{\mathbb{C}}$.
It is a constant sheaf on $\mathbb{CP}^1$.
It is not a constant sheaf on $\mathbb{CP}^1$, and $(j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$.
It is not a constant sheaf on $\mathbb{CP}^1$, and $(j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$.
All the above is wrong.
I don't know, but I don't want to make a wrong choice.
For $\pi : \mathbb{C} \longrightarrow \{*\}$, $U = B_1(0) \cup B_1(3)$, which one is correct:
$(\pi^{*,\mathrm{pre}} \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}$, $\quad (\pi^* \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}$.
$(\pi^{*,\mathrm{pre}} \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}^2$, $\quad (\pi^* \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}$.
$(\pi^{*,\mathrm{pre}} \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}$, $\quad (\pi^* \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}^2$.
$(\pi^{*,\mathrm{pre}} \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}^2$, $\quad (\pi^* \underline{\mathbb{Q}}_{\{*\}})(U) = \mathbb{Q}^2$.
For $j : \mathbb{C} \longrightarrow \mathbb{CP}^1$, what is true about $Rj_* \underline{\mathbb{Q}}_{\mathbb{C}}$?
$(R^1 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$, $\quad (R^2 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$.
$(R^1 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$, $\quad (R^2 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$.
$(R^1 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$, $\quad (R^2 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$.
$(R^1 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$, $\quad (R^2 j_* \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$.
Do you know what is $\Gamma_c(\mathbb{C}, \underline{\mathbb{Q}}_{\mathbb{C}})$ and $\Gamma_c(\mathbb{CP}^1, \underline{\mathbb{Q}}_{\mathbb{CP}^1})$?
$\Gamma_c(\mathbb{C}, \underline{\mathbb{Q}}_{\mathbb{C}}) = \mathbb{Q}$, $\quad \Gamma_c(\mathbb{CP}^1, \underline{\mathbb{Q}}_{\mathbb{CP}^1}) = \mathbb{Q}$.
$\Gamma_c(\mathbb{C}, \underline{\mathbb{Q}}_{\mathbb{C}}) = \mathbb{Q}$, $\quad \Gamma_c(\mathbb{CP}^1, \underline{\mathbb{Q}}_{\mathbb{CP}^1}) = 0$.
$\Gamma_c(\mathbb{C}, \underline{\mathbb{Q}}_{\mathbb{C}}) = 0$, $\quad \Gamma_c(\mathbb{CP}^1, \underline{\mathbb{Q}}_{\mathbb{CP}^1}) = \mathbb{Q}$.
$\Gamma_c(\mathbb{C}, \underline{\mathbb{Q}}_{\mathbb{C}}) = 0$, $\quad \Gamma_c(\mathbb{CP}^1, \underline{\mathbb{Q}}_{\mathbb{CP}^1}) = 0$.
Could you explain the notation again?
For $j : \mathbb{C} \longrightarrow \mathbb{CP}^1$, what is true about $Rj_! \underline{\mathbb{Q}}_{\mathbb{C}}$?
$(R^0 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$, $\quad (R^1 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$.
$(R^0 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$, $\quad (R^1 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$.
$(R^0 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$, $\quad (R^1 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = 0$.
$(R^0 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$, $\quad (R^1 j_! \underline{\mathbb{Q}}_{\mathbb{C}})_\infty = \mathbb{Q}$.
This question is too easy for me. Ask more difficult questions next time!

Date: December 2, 2023.

2. Examples

2.1. Theorem environment.

Theorem 2.1 (see [2, Theorem 18.5.1])**.** *...*

Setting 2.2. *...*

Definition 2.3. *...*

Lemma 2.4. *...*

Proposition 2.5. *...*

Corollary 2.6. *...*

Conjecture 2.7. *...*

Claim 2.8. *...*

Example 2.9. *...*

Exercise 2.10. *...*

Fact 2.11. *...*

Question 2.12. *...*

Warning 2.13. *...*

Black box. *...*

Conventions and Notations. *...*

Remark 2.14. ...

Remarks.

1. ...
2. ...

References

[1] Jens Niklas Eberhardt. K-motives and Koszul duality. *Bulletin of the London Mathematical Society*, 54(6):2232–2253, 2022.

[2] Ravi Vakil. The rising sea: Foundations of algebraic geometry. *preprint*, 2017.

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