|  |  |
| --- | --- |
| Last Name |  |
| First Name |  |

**Task 1**. **Control of force diagram**

1. Paste 2 screenshots of 2 different **configurations** on how you move around the pole in the force diagram to show the interactive force control:

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration A** | screenshot of the Rhino viewport,  showing the form and force diagram  in **configuration B** |

1. Explain the **relationship** between the position of the pole in the force diagram, the force magnitude and the length of the elements in the form diagram: (**max.** **50 words!**)

...

...

...

**Task 2**. **Graphical limit of forces to 12kN at supports**

‌

1. With which **geometric** element can you limit the forces in the force diagram and what determines its size? (**max. 15 words!**)

...

1. Where is graphically the feasible domain for **both** cable forces to be below the threshold? (**max. 15 words!**)

...

|  |
| --- |
| screenshot of the Rhino viewport,  showing the force diagram  with the **feasible domain** |

1. Where must the pole be positioned so that both the left and right support forces are **exactly** 12 kN? (**max. 15 words!**)

...

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram,  for both forces **exactly** 12kN in **tension** | screenshot of the Rhino viewport,  showing the form and force diagram,  for both forces **exactly** 12kN in **compression** |

**Task 3**. **Single-sided bridge**

1. Paste 1 screenshots of the **single-sided** bridge:

|  |
| --- |
| screenshot of the Rhino viewport,  showing the form and force diagram  of the **single-sided bridge** |

1. Specify the **state** (tension/compression) of both the upper and lower element if both are anchored on the same side: (**max. 15 words!**)

...

1. How does the force **magnitude** and **state** (tension/compression) change for the element that switched side in comparison to its initial both-sided position? (**max. 15 words!**)

...

**Task 4**. **Fractured rocks**

1. Paste 3 screenshots of the elements violating the **left, right,** and **both** fractured rock constraints.

|  |  |  |
| --- | --- | --- |
| screenshot of the Rhino viewport,  showing the form diagram  **violating the left** | screenshot of the Rhino viewport,  showing the form diagram  **violating the right** | screenshot of the Rhino viewport,  showing the form diagram  **violating both** |

**Task 5**. **Own bridge designs**

1. Find two **existing** bridge structures that can be simplified to a single-node structure as references.

|  |  |
| --- | --- |
| bridge reference 1 | bridge reference 2 |
| bridge name 1, year of construction | bridge name 2, year of construction |

1. Paste 2 screenshots of your favourite bridge designs that respect both **constraints** of the limited force magnitudes of **12kN** from Task 2 and the **fractured rocks** from Task 4.

(they can be either single-sided or both-sided).

|  |  |
| --- | --- |
| screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design A** | screenshot of the Rhino viewport,  showing the form and force diagram,  of your **favourite design B** |

C1) Why did you choose your designs **architecturally**? (**max. 15 words!**)

...

C2) Why did you choose your designs **structurally**? (**max. 15 words!**)

...