

GRADING RUBRIC FOR PROJECT2023 MA1101

OPPGAVE 1 - 18 points

- (a). **8 points**:- Verifying that $g(x)$ is continuous (1 point). Considering the situation that rules out the trivial case where the endpoints are zeros (1 point). Obtaining the two required inequalities (2 points each). Using Theorem 2.5.1 or any other applicable theorem (2 points).
- (b). **10 points**:- Obtaining the function $f(x)$ (5 points). Considering the case where the endpoints are zeros (1 point). Obtaining the two required inequalities (1 point each). Applying the relevant theorem to arrive at the answer (2 points).

OPPGAVE 2 - 18 points

- (a). **8 points**:- Identifying the correct mathematical notion to use here (.i.e. Rolle's Theorem, Mean Value Theorem, etc.) (2 points). Applying the selected mathematical notion for the first time (3 points) and applying it for the second time (3 points).
- (b). **10 points**:-
- (i). **Indirect Proof**: Identifying the correct assumptions and conclusions required in order to give the indirect proof (3 points). Presenting a correct argument that solves the problem (7 points) or
- (ii). **Direct Proof**: Identifying the correct assumptions and conclusions required in order to give the direct proof to the question (3 points). Considering all possible cases needed to completely address and solve the problem correctly (7 points).

OPPGAVE 3 - 18 points

- (a). **3 points**:- Presenting the correct explanation to the given question (3 points).
- (b). **7 points**:- Computing $f'(0)$ correctly (4 points). Justifying that $\cos(1/h)$ is bounded as h approaches ∞ and thus confirming the conclusion that $f'(0) = 0$ (3 points).
- (c). **8 points**:- Choosing the correct answer (4 point). Presenting an acceptable justification of the selected answer (4 points).

OPPGAVE 4 - 18 points

Obtaining or deriving the function $f(x)$ (6 points). Identifying the required mathematical notion to use here (2 points). For correctly applying the selected mathematical notion (.ie. including computations) (6 points). Finding the minimal point (.ie. finding the required shortest possible time) (4 points). **Note:** You lose points if you fail to justify that the point obtained is indeed the minimal point.

OPPGAVE 5 - 24 points

Award 8 points for each of the three required solutions here.

- Presenting the correct explanation of a mathematical term or result used in the previous tasks (4 points).
- Providing a good example that properly illustrates the selected mathematical term or result. (4 points). **Note:-** If one decides to use diagram(s) and picture(s) as illustrations, then the diagram(s) or picture(s) must be well labeled and well described in order to obtain the full points.