

Rettemal MA1101 Sommer 2024 (Konteksamen)

Total of 70 points possible, 10 per problem. Minor computational mistakes that do not affect the overall problem are not penalized. The distribution of points is as follows:

(1) 1p per correct true/false

(2) Intervals (2p), asymptotes (3p), sketch (3p), behaviour at the origin (2p)

(3a) Finding the correct derivatives (2p), writing down the correct polynomial (2p)

(3b) Identifying that  $|R_2(0.1)|$  bounds the error (2p), showing that it indeed is smaller than 0.0005 (4p)

(4) a): 3p, b): 3p, c): 4p, partial points for partial progress (especially for c) – grade generously).

(5) a): 2p, b): setting up the induction (2p), performing the induction step (4p), c): 2p, partial points for partial progress.

(6) a): 3p, b): 3p, c): 4p, partial points for partial progress.

(7) Bounding  $f$  correctly (4p). Using the bound to demonstrate the convergence of the integral (6p); the justification need not be completely rigorous, but only to demonstrate understanding.