

Written HW24 – MATH 2510 Spring 2021

Due by 23 April for timely completion credit

Consider “differential algebra theory” which has predicates ∂ , \cdot , and $+$ which obeys the following two axioms:

$$\forall x \forall y \left(\partial(x \cdot y) = (\partial x) \cdot y + x \cdot (\partial y) \right) \quad (1)$$

$$\forall x \forall y \left(\partial(x + y) = \partial(x) + \partial(y) \right) \quad (2)$$

Write a proof of the sentence

$$\forall x \forall y \forall z \left(\partial((x \cdot y) \cdot z) = \left((\partial x) \cdot y + x \cdot (\partial y) \right) \cdot z + (x \cdot y) \cdot (\partial z) \right).$$