

## Exercise 3.18

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January 2, 2015

**Exercise.** Find a 2- form which is not the product of 1- forms.

*Proof.* If  $w$  and  $v$  are two 1-forms on  $T_p\mathbf{R}^4$ , namely,

$$w = a_1 dx + b_1 dy + c_1 dz + d_1 du, v = a_2 dx + b_2 dy + c_2 dz + d_2 du,$$

then

$$w \wedge v =$$

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