1617-257 Wed Feb 15, hour 54: Wedge products, tangent vectors

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HW14 due, HW15 on web by midnight.
Read Along. Sections 27-29.

Riddle Along. Can you colour the points of the plane in 4 colours such that no two points of distance exactly 1 will have the same colour? In 5 colours? 6? 7? 8?

Thm $\exists!$ op $\wedge : A^k(V) \times A^l(V) \longrightarrow A^{k+l}(V)$ s.t.

1. $\wedge$ is associative & bilinear.
2. $\wedge$ is "super-symmetric".
3. $\psi_I = \phi_{i_1} \wedge \phi_{i_2} \wedge \dots \phi_{i_k}$

only uniqueness remains

on board

Also, if $T: V \longrightarrow W$, then $T^*: A^k(W) \to A^k(V)$ and $T^*(f \wedge g) = T^*(f) \wedge T^*(g)$.

A tangent vector $\xi = (x, v)$ to $\mathbb{R}^n$; $T_x(\mathbb{R}^n)$ is a vector space.
Curves & tangents.
Tangents and directional derivatives: $D_\xi f$ — done line.
Push forwards under $\alpha: \mathbb{R}^k \to \mathbb{R}^n$; covariance
$T_p(M)$ for a manifold M; curves, directional derivatives, pushforwards.
C^r vector fields.

add details?

UTFA Council Meeting: Rotman 368 Classroom B