

## MA3408 Week 11

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### Question 1.

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Show that  $B(G \times H) \simeq BG \times BH$  (whenever this makes sense).

### Question 2.

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Let  $\pi: E \rightarrow X$  be a principal  $S^1$ -bundle over a simply-connected space  $X$ . Let  $a \in H^1(S^1; \mathbb{Z})$  be a generator. Show that

$$c_1(\pi) = d_2(a)$$

where  $d_2$  is the differential on the  $E_2$ -page of the Leray–Serre spectral sequence associated to  $\pi$ , i.e.,  $E_2^{p,q} \cong H^p(X; H^1(S^1)) \implies H^{p+q}(E, \mathbb{Z})$ .