Homework 6

Topology - Atkinson

Due Thursday, 11/1

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(1) 4.18: How is $\mathbb{T}^2\#\mathbb{K}^2$ classified? $\mathbb{K}^2\#\mathbb{K}^2$?

(2)

▷ **Exercise 4.20.** Classify the following surfaces:

(1) ABD, BLJ, BJK, ACI, BCH, AGI, EGH, EFH, EJK, LEK, BDE, ACD, CDF, BCF, LBE, EFJ, BFK, ABG, CHI, FHI, LFK, LFJ, DFI, DGI, DEG, BGH.

(2) ABH, AHG, AGO, AOF, AFX, DAX, ADJ, ACJ, ACS, AES, AEZ, ABZ, CSW, SWR, SNR, SEN, EYZ, ZYV, VUY, PQU, ZVW, RVW, BZW, BCW, BCI, BHI, HIL, KHL, GHK, FGK, FGT, POT, OGT, OFK, PKO, PKL, PLQ, MLQ, MRQ, QRV, QUV, FTX, UTX, PTU, UYX, XDY, DEY, DEN, DNJ, MNJ, MNR, MIJ, CIJ, MIL.

(3) ABD, ABE, EBG, EFG, DEF, BDF, FIG, BIG, FIJ, JIN, MJN, MKN, MJF, LFM, LFN, KLN, NFH, NOH, OHL, KLO, LHI, LIM, KMO, IOM, NIO, BCI, ACE, CEI, DEI, DHI, ACD, CDH, BCH, BFH.

(3) 4.23: Identify the following surfaces using the Tietze transformations:

(a) $abc^{-1}deb^{-1}a^{-1}d^{-1}ce$

(b) $abcbdedec^{-1}afgfg^{-1}$

(c) $abcde^{-1}d^{-1}ec^{-1}a^{-1}b^{-1}$

(4) 4.26: The cylinder and the Möbius band are surfaces with boundary. Describe each as a sphere, a connected sum of n tori, or a connected sum of n projective planes with a finite number of disks removed.