University of Leeds
Department of Pure Mathematics

MATH 3032 GRAPH THEORY – TERMINOLOGY AND NOTATION

LIST 7

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66) k-COLOURABLE, **k-CHROMATIC**, $\chi(G)$ — G is **k-colourable** if each of the vertices of G can be assigned one of k colours in such a way that no 2 adjacent vertices have the same colour.

G is **k-chromatic** if G is k-colourable but not $(k-1)$-colourable. The **chromatic number** of G is defined by: $\chi(G) = k \Leftrightarrow G$ is k-chromatic.

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67) CRITICAL, **k-CRITICAL** — G is **critical** if $\chi(H) < \chi(G)$ for every proper subgraph H of G. G is **k-critical** if $\chi(G) = k$ and G is critical.

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68) δ, Δ — $\delta(G)$ = the smallest vertex degree in G, and $\Delta(G)$ = the largest vertex degree in G.

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69) MAP, k-FACE-COLOURABLE, FACE-CHROMATIC NUMBER $\chi^*(G)$ — A **map** is a plane graph with no cut edges.

A map is **k-face-colourable** if its faces can be coloured using k colours in such a way that no two faces having the same colour are adjacent.

The **face-chromatic number** $\chi^*(G)$ for a map G is the least k for which G is k-face-colourable.

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70) k-EDGE COLOURABLE, CHROMATIC INDEX $\chi'(G)$ — A graph is **k-edge colourable** if its edges can be coloured using k colours in such a way that no two adjacent edges have the same colour.

The **chromatic index** $\chi'(G)$ for a loopless graph G is the least k for which G is k-edge colourable.

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71) TAIT COLOURING — A **Tait colouring** of a cubic graph G is a 3-edge colouring of G (in which no 2 adjacent edges take the same colour).

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72) CHROMATIC NUMBER $\chi(S)$ of a surface S — The **chromatic number** $\chi(S)$ of S is the number of colours needed to properly colour the faces of any map on S.

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73) EULER CHARACTERISTIC — The **Euler characteristic** $n(S)$ of S is given by $n = \nu - \varepsilon + \varphi$ (evaluated for a suitable graph G embedded on S).

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74) GENUS $g(S)$ — The **genus** $g(S)$ of a surface S is the greatest number of distinct continuous non-selfintersecting closed curves which can be drawn on S without separating it into distinct regions.

◁ ENDS ▷

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