

Applied Combinatorics Quiz 1

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September 24, 2020

True-False:

- F 1. $P(10, 4) = 720$
- F 2. $C(10, 4) = 120$
- F 3. Any connected graph with an even number of edges has an Euler circuit.
- T 4. There is a connected graph with 500 vertices and 5000 edges which does not have a Hamiltonian cycle.
- F 5. The number of lattice paths from $(0, 0)$ to $(12, 12)$ which pass through $(6, 8)$ is $C(12, 6)C(12, 8)$
- F 6. If G is a graph and $\chi(G) = 3$, then $\omega(G) = 3$
- T 7. If G is a graph on 20 vertices and every vertex has at least 12 neighbours, then G has a Hamiltonian cycle.
- F 8. The number of lattice paths from $(0, 0)$ to $(12, 12)$ which do not go above the diagonal is the Catalan number $\frac{C(12,6)}{7}$
- T 9. $\log n = O(\sqrt{n})$
- T 10. $\log n = o(\sqrt{n})$