Graphs and Networks Below Year 10?

This presentation at the MAV Conference was aimed to challenge teachers to try teaching one of three ‘graphs and networks’ lesson sequences in their 2025 teaching program.

Year 7 teachers were challenged to modify the well known ‘How many handshakes’ lessons to model a ‘round robin’ competition in which wins are represented by directed edges on a complete graph. In a follow-up ‘ how many’ lesson students are asked to determine how many complete directed graphs there are on five vertices – ranging from directed edges 2 2 2 2 2 for an equal first result to 4 3 2 1 0 for an ordered first to fifth result. The second ‘how many ‘ lesson is the well known How many edges on a complete graph on n vertices.

Year 8 teachers were challenged to have students discover Euler’s Rule V + I = E + 2 for convex polyhedral and the to extend that result to recognize that it works for all planar graphs (maps, polygons, etc). I a follow-up lessons students develop a proof– essentially by mathematical induction – starting from an open face surrounding a single vertex, for which 1 + 1 = 0 + 2

Year 9 teachers were challenged to find the length of Eulerised trails – firstly around a simple network and then around a real street network that might be needed for postal delivery, buses or garbage trucks.

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