This department welcomes short notes and problems believed to be new. Contributors should include solutions where known, or background material in case the problem is unsolved. Send all communications concerning this department to I. G. Connell, Department of Mathematics, McGill University, Montreal, P.Q.

A THREE DIMENSIONAL ANALOGUE OF PAPPUS'S THEOREM

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THEOREM. *If* P, Q, R *are any three points on a line* a *and* p, q, r *are any three lines that pass through a point* O *and lie in a plane* π *which meets the line* a *in a point* A *distinct from* O, *then the three lines* $\ell = Qr \cdot Rq$, $m = Rp \cdot Pr$, $n = Pq \cdot Qp$ *lie in a plane* (*through* O).

Proof. Let an arbitrary line b in π through A meet p, q, r in P', Q', R' respectively and define $L = QR' \cdot RQ'$, $M = RP' \cdot PR'$, $N = PQ' \cdot QP'$. Then ℓ, m, n are OL, OM, ON respectively. But Pappus's theorem applied to ranges P, Q, R and P', Q', R' in the plane of the lines a and b shows that L, M, N are collinear. Hence ℓ, m, n are coplanar. Since they already pass through O the proof is complete.

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