Haley-Knott regression

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Haley-Knott regression

A quick approximation to Interval Mapping.

\[ E(y_i | q_i) = \mu_q \]

\[ E(y_i | M_i) = E[ E(y_i | q_i) | M_i] = \sum_j Pr(q = j | M_i) \mu_j \]

\[ = \sum_j p_{ij} \mu_j \]

Regress \( y \) on \( p_i \), pretending the residual variation is normally distributed (with constant variance).

\[ LOD = \frac{n}{2} \log_{10} \left( \frac{RSS_0}{RSS_1} \right) \]
Two markers separated by 20 cM, with the QTL closer to the left marker.

The figure at right shows the distributions of the phenotype conditional on the genotypes at the two markers.

The dashed curves correspond to the components of the mixtures.
Haley-Knott results

![Graph showing LOD scores for IM and HK across different chromosomes.](image-url)
H-K with selective genotyping