

How to estimate the number of people on a March

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In these days of quite substantial marches it is useful to be able to estimate the number of people on the march.

s = length of the route of the march, in feet

t = time when the front of the march leaves the starting point

T = time when the front of the march arrives at its destination

The velocity of the march, $v = s/(T - t)$, decimalised.

Two observers are positioned together somewhere on the route of the march.

The head of the march passes the observers at time t_1 .

The end of the march passes the observers at time T_1 .

The length of the march is $v (T_1 - t_1)$, decimalised, in feet.

The observers then need to agree on the average width of the march in persons A and the average distance B between ranks of marchers, toe to toe, in feet.

The number of marchers, N, may then be estimated to be

$$n = As (T_1 - t_1) / B / (T - t)$$

A simple example

A common route for a march is from Embankment Station to Hyde Park Speakers' Corner via Houses of Parliament, Whitehall, Trafalgar Square, Piccadilly Circus, Piccadilly and Hyde Park Corner, a total distance of 3.2 miles or 16896 feet.

Also common is the situation where, coincidentally, the tail end of the march is leaving the starting point just as the vanguard is arriving at the destination.

This gives $(T - t) = (T_1 - t_1)$

Such a march over the above route usually takes about 1.5 hours from starting point to the destination for a given marcher.

Taking $A = 6$ and $B = 4$ we arrive at the figure

$$\begin{aligned} N &= As/B \\ &= 6 \times 16896/4 \\ &= 25344 \end{aligned}$$

Say 25000 to avoid spurious accuracy.

This example does not relate to any particular march.

Note: At the head of the march and just after starting off time, marchers are very close together. Subsequent marchers are fewer and farther between.

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