FIGURE 28.7. A differential equation is a good approximation to a discrete recursion when change is gradual. (*A*) The series of triangles shows the solution to the recursion $p_{t+1} = pt + sp_t q_{t'}$ for generations 0, 1, 2, ... The *continuous red curve* is the solution to $dp/dt = sp(t)q(t)$. This has the same slope at time $t = 0$, when $p(0) = p_0$. (Compare the slope of the *red curve* with the *diagonal line*, which has slope $sp_0 q_0$.) However, because the differential equation allows for a continuous acceleration (i.e., an upward curve) as allele frequency increases, it increases slightly faster than the discrete recursion (*black steps*). (*B*) The discrete recursion (*black dots*) with $W_P/W_Q = 1.1$ compared with the continuous solution (*red curve*) to $dp/dt = spq$ with $s = 0.1$; allele frequency is initially 0.01. Agreement is close at first, but errors build up over time; nevertheless, the error is never more than 4%.

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