Bleep test for Superman

The standard bleep test would clearly not be a challenge for someone as fast as our hero, so let's modify it slightly:

Standard Test:	**Superman Test:**
• Increase speed by $0.5km/h$ at each stage. • Each stage lasts for about 60 seconds.	• Increase speed by 20% at each stage. • Each stage lasts for just one 20 metre length.

A speed increase of 20% *corresponds to a decrease in time taken to run the 20 metres of* $\frac{1}{1.2}$ *or* 17%*. Since he only does* $20m$ *at each stage, the stages will go by faster and faster, and it is impossible for the test, however many stages there may be, to take longer than a minute.*

- Starting at $2ms^{-1}$, or $7.2km/h$, around the same as a standard test, Superman would be running as fast as the fastest 100m sprinters by stage 10, having run 200m in total and having been running for just over 50 seconds.
- By 57 seconds in, having completed the 17th stage, he is running fast enough to trigger motorway speed cameras.
- At stage 24 (just a couple of seconds later), he is outpacing formula 1 cars.
- He breaks the sound barrier at stage 30, 59.7 seconds in, and by the end of the next stage rivals fighter jets in speed.
- He breaks the airspeed record of $2193mph$ (held by the Lockheed SR-71 Blackbird) after 59.9 seconds at stage 35, and before he's gone 1000 metres he is faster than the space shuttle's re-entry speed of $17{,}500mph$.
- At stage 54 he is now faster than the fastest man-made object, the Helios 2 Solar Probe which made a near-orbit of the sun at a top speed of $157{,}000mph$.
- There's very little to compare his speed to between stage 54 and stage 100, but it should be noted that his speed doubles 12 times until finally, still (just) less than a minute since starting the test, he matches the speed of light.

Distance: $20m$ Speed: $2ms^{-1}$ Time: $\frac{20}{2} = 10s$

Time taken forms a geometric series, first term: $a = 10$ common ratio: $r = \frac{5}{6}$

$$S_\infty = \frac{a}{1-r} = \frac{10}{\left(1-\frac{5}{6}\right)} = \frac{10}{\frac{1}{6}} = \boldsymbol{60\ seconds}$$